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ARCTIC LAND USE RESEARCH PROGRAM 1977: A SURVEY OF THE
FISHERIES RESOURCES OF THE CENTRAL NORTHWEST
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Arctic Land Use Research Program 1977: A Survey of the Fisheries Resources of the Central Northwest Territories

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Arctic Land Use Research Program 1977: A Survey of the Fisheries Resources of the Central Northwest Territories

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Department of Fisheries and Environment
Fisheries and Marine Service

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not necessarily of the Departments.

Cette publication peut aussi être obtenue en
français.

PREFACE

The Land Use Information Map Series is now entering its eighth year of research in the Canadian North. During the past seven year, project staff have completed reconnaissance-scale environmental and social mapping for the western half of the land area north of 60°, or nearly 20 percent of Canada. A number of scientists and researchers have contributed to this project since 1971 and all are confident that the high standard of their work has helped the maps to become a key tool for land and resource management in the north.

Project staff continually endeavour to maintain contact with major users of the maps produced. We have tried to ensure that users fully understand the strenghts and limitations of the data shown on the maps. To facilitate the effective use of the maps project staff have prepared a series of user handbooks, to describe and explain research methods and to provide detailed survey data to supplement notes published on the maps.

It is our hope that this handbook on fisheries research will provide users with a significant insight into the techniques and methods of the major field survey which provides data for the Land Use Information Series. We hope that this detailed background data will assist specialist users in the effective management of land and water resources in northern Canada. A list of other user handbooks available can be found at the back of this publication.

Ken Taylor
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December, 1978.

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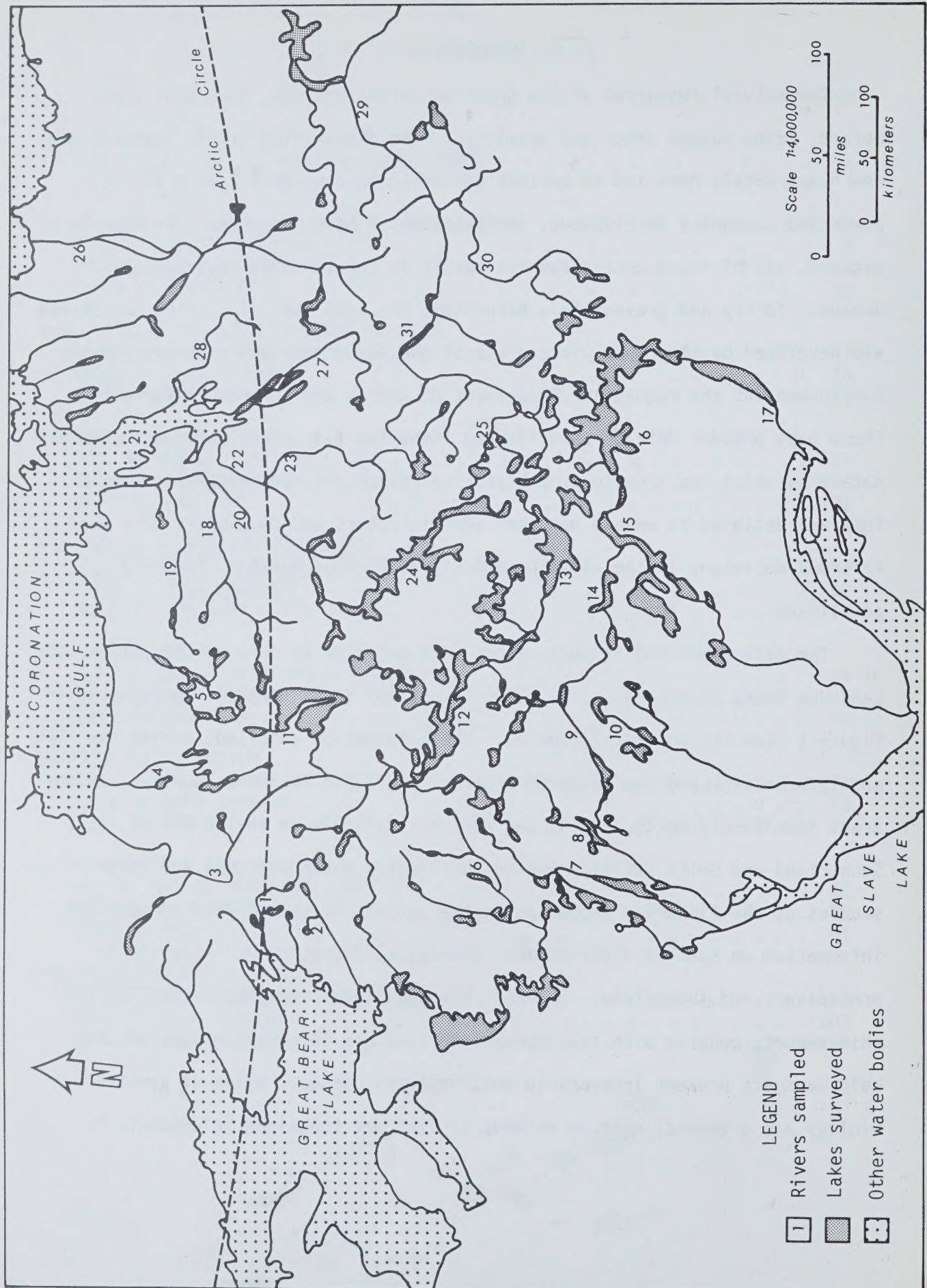
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INTRODUCTION

The natural resources of the Canadian north, are now, more than ever before, being sought after and developed. The discoveries of oil, natural gas, and heavy metals have led to seismic and drilling programs, road building, power and community development, and problems of waste disposal. Improperly managed, all of these activities can result in irreversible environmental damage. To try and prevent this happening, the Land Use Information Map Series was developed by the Lands Directorate of the Department of Fisheries and the Environment at the request of Department of Indian and Northern Affairs. These maps present data on wildlife and fisheries resources, information on native harvests and locations of historical sites and modern development. They are designed to enable northern administrators and developers make well informed decisions in the planning and controlling of northern land-use activities.

The data presented in this report were compiled as part of the 1977 Arctic Land Use Research program. The major rivers and lakes sampled are depicted in figure 1 (see key to fig. 1 Page 3). The information compiled, during the 1975 and 1976 Arctic Land Use Research Program (A.L.U.R.) Fisheries Surveys, on the areas immediately north, south, and west is available in the report of Sutherland and Golke (1978). Due to the limited nature of this and other studies of the fisheries resources in the central Northwest Territories, the information on species distribution, abundance, migration and spawning is preliminary and incomplete. However, the detailed information contained in this report, coupled with the appropriate Land Use Information maps should help managers prevent irreparable environmental damage. Notes on species biology and a general note on hazards to fish are contained in appendix A.

FIGURE 1: SURVEY AREA MAP



KEY TO FIGURE 1, SURVEY AREA MAP

GREAT BEAR LAKE AND CORONATION GULF DRAINAGES (FIG. 2)

1. Sloan River
2. Tilchuse River
3. Coppermine River
4. Asiak River
5. Tree River

N.W. GREAT SLAVE LAKE DRAINAGE SYSTEMS (FIG. 3)

6. Acasta River
7. Emile River
8. Indin River
9. Snare River
10. Yellowknife River

COPPERMINE RIVER SYSTEM (FIG. 4)

3. Coppermine River
11. Takijuq River
12. Point Lake
13. Lac de Gras

N.E. GREAT SLAVE LAKE DRAINAGES (FIG. 5)

14. Courageous Lake
15. MacKay Lake
16. Aylmer Lake
17. Lockhart River

HOOD RIVER SYSTEM (FIG. 6)

18. Hood River
19. James River
20. Booth River
21. Bathurst Inlet

BURNSIDE RIVER SYSTEM (FIG. 7)

22. Burnside River
23. Mara River
24. Contwoyto Lake
25. Contwoyto River

ELLICE, WESTERN AND HIUKITAK RIVERS (FIG. 8)

26. Ellice River
27. Western River
28. Hiukitak River

BACK RIVER DRAINAGE SYSTEM (FIG. 9)

29. Back River
30. Baillie River
31. Beechey Lake

METHODS

The data presented in this report were compiled from a recent reconnaissance survey, previous studies, and comments of local residents. The sampling survey was conducted by the Fisheries and Marine Service (FMS) from July 5 to August 21, 1977. Sampling locations were reached by aircraft and sampling methods included gill netting, seining, angling, and direct observation at spawning locations. On larger lakes gill nets were set from the floats of a De Havilland Beaver aircraft during the first two weeks of the survey. For the remainder of the survey, gill nets were set from the shores of smaller lakes and rivers. A Bell 206B Jet Ranger helicopter was the vehicle used during that period.

Gill nets used were nylon and ranged in mesh size from 12.7 cm to 2.5 cm (5" to 1") stretched mesh and set times varied around 24 hours. Sets were made of either single mesh 22.8 meter nets (25 yards) (3.81 - 11.43 cm or 1 1/2" - 4 1/2" stretched mesh), 45.6 - 182.8 cm mixed gangs (50 - 200 yd), or 18.3 m (20 yard) mixed mesh nets (2.54 - 12.70 cm or 1" - 5" stretched mesh). A 9.5 m (30-foot) beach seine with .64 cm (1/4") mesh was used to capture minnows and fry in the shallows.

All fish species caught were identified; weighed to the nearest 20 grams (1 oz), or to the nearest 50 grams (2 oz) in the case of fish over 3,500 grams (123 oz); measured, fork length to the nearest 0.5 cm (0.2 in); and, where appropriate, scale samples were taken. Samples of all species in a net set were then autopsied to determine sex, maturity (condition), and stomach contents. Otoliths were removed from trout, char and burbot; both scales and otoliths were aged at the Freshwater Institute in Winnipeg. Identifications were made using Scott and Crossman 1975.

Sampling sites are shown on Figs. 2 to 9. The odd numbered tables, 1-15,

summarize catches and net set information for each area and the even numbered tables, 2-16, give detailed information on fish caught at each site.

Statistics on river drainage basin areas and flows were taken from the 1976 Fisheries and Environment publication of surface water data for Yukon and the Northwest Territories (Water Survey of Canada 1976). Information on commercial fishing quotas and fishing were obtained from D. Dowler, Chief of Enforcement, FMS, Yellowknife, and R. Moshenko, FMS, Winnipeg.

RESULTS

GREAT BEAR LAKE AND CORONATION GULF DRAINAGES

General

This area includes the Sloan and Tilchuse rivers which drain into the east side of Great Bear Lake and the Asiatic and Tree rivers which drain into the Arctic Ocean (Fig. 2). The Sloan and Tilchuse rivers are within the tree line, are clear and cold and have shorelines and bottom substrates of sand or rock. These lakes and rivers have more fish and vegetation than the barrens rivers. Asiatic and Tree rivers and nearby lakes are cold and extremely clear, bordered by rock and sand eskers covered with low shrubs and moss. The lake bottoms consist primarily of sand. Near its mouth, the Tree River has a mean daily discharge of 39.1 cubic meters/second (1,380 cfs) (Water Survey of Canada 1976).

Aquatic Resources

Arctic char spawn downstream of the sampling site on the Tree River, during fall. Fish catches in the rivers draining into Great Bear Lake were larger and species diversity was greater than in those rivers draining into the Arctic Ocean. Fish sampling data can be found in Tables 1 and 2.

Domestic and Commercial Fishing

Residents of Coppermine camp at the mouth of the Tree River for sealing and take between 450 to 900 kg (990 to 1,985 lb) of Arctic char each summer. This domestic catch was much higher in the past. There is also a sport-fishing quota of 700 Arctic char, but the annual catch is about 400 fish or approximately 2000 kg (4,410 lb). The fishermen operate from an outpost camp of a Great Bear Lake fishing lodge.

Great Bear Lake

Great Bear Lake, the largest lake contained entirely within Canada, has a surface area of 28,490 sq km (11,000 sq mi.) and a maximum depth of 441 m (1447 ft). Because temperatures in the main body of the lake rise above 4°C (39°F) only in the warmest years, Great Bear Lake is considered to be one of the world's coldest lakes. Due to the extreme oligotrophic nature of the lake, fish growth is slow and consequently the lake has never been fished commercially. Fish species found in abundance throughout the lake are lake trout and deepwater sculpin, both being present in deep and shallow waters. Humpback whitefish and lake cisco are abundant in bays isolated from the main water circulation of the lake. Species which inhabit the lake margin or river mouths are Arctic grayling, northern pike, round whitefish, slimy sculpin and ninespine stickleback. Species barely able to maintain a position in the lake are burbot and longnose sucker. The lake supports a substantial sport fishery, primarily for lake trout. Arctic grayling and northern pike are also sport fished. More detailed and specific information on the limnology of the lake, the biology of the fish species, and the sport fishery is available in the form of reports and publications from the Fisheries and Marine Service (eg. Johnson 1974).

FIGURE 2

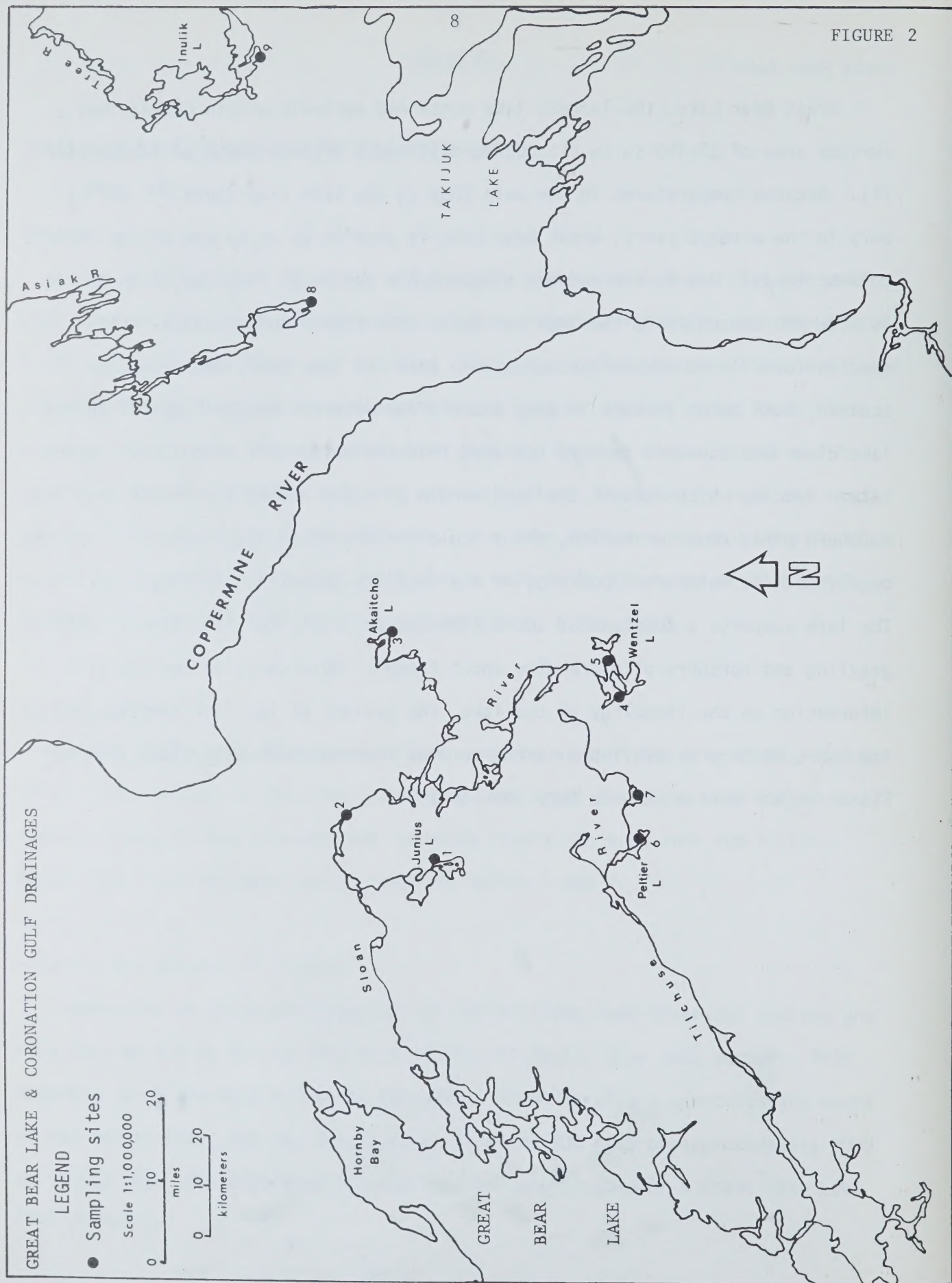


Table 1. Fisheries resource sampling summary, Great Bear Lake and Coronation Gulf Drainages, NWT.

Set	Date	Location	Set Hrs. & Net Length (m)	Species and Numbers Caught					
				Lake Trout	Arctic Grayling	Round Whitefish	Longnose Sucker	Burbot	Coregonus
1	18/8/77	66°27'Nx116°38'W	20.5a	1			2		
2	18/8/77	66°36'Nx116°25'W	20.0c	8		7	3		
3	18/8/77	66°32'Nx115°53'W	21.0c	1	3	2	1	2	
4	13/7/77	66°08'Nx115°53'W	20.0a						
5	18/8/77	66°09'Nx115°43'W	20.5a	3	1		3		1
6	18/8/77	66°05.5'Nx116°32'W	21.0a						
7	18/8/77	66°06'Nx116°20'W	21.0a	1					
8	10/8/77	66°39'Nx114°12'W	21.0a	8	1	2			
9	14/7/77	66°45'Nx113°04'W	14.0e	5					

a = 22.8 m
b = 18.3 m
c = 45.6 m
d = 91.4 m
e = 104.7 m

Table 2. Fisheries resource sampling survey raw data, Great Bear Lake and Coronation Gulf Drainages, NWT.

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yrs)	Sex	Maturity	Stomach Contents
<u>Lake Trout (<i>Salvelinus namaycush</i>)</u>								
1	Junius Lake 66°27'Nx116°38'W 18/8/77	7.62	79.0	4400	28	M	ripe and running	
2	Sloan River 66°36'Nx116°25'W 18/8/77	3.81	68.0	3300				
		3.81	40.5	300	6		imm.	
		3.81	28.5	480	7		imm.	
		3.81	36.0	700	9	F	spent	Unidentified fish
		7.62	41.5	1200	11	F	spent	Diptera
		7.62	51.0	4900	23	F	spent	
		7.62	76.5	800				
		7.62	42.0					
3	Akaitcho Lake 66°32'Nx115°53'W 18/8/77	7.62	32.0	400	8		imm.	Unidentified fish
5	Wentzel Lake 66°09'Nx115°43'W 18/8/77	7.62	78.0	4500				
		7.62	59.0	1800				
		7.62	38.5	670	10	Unknown		<i>Coregonus</i> sp.
7	Unnamed Lake 66°06'Nx116°20'W 18/8/77	3.81	42.0	850				

Table 2. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
8	Unnamed Lake 66°39'Nx114°12'W 10/8/77	3.81 3.81 3.81 3.81 3.81 3.81 3.81	57.0 60.0 18.5 26.0 19.5 20.5 18.0 22.0	1550 2500 75 100 125 100 125 150	6			
9	Inulik Lake 66°45'Nx113°04'W 14/7/77	7.62 7.62 7.62 7.62 7.62	64.5 74.0 79.4 73.5 20.0	3200 4500 4900 4400 80	27 22 4	M M	near ripe near ripe	<i>Collembola</i> sp. Unidentified fish Trichoptera
<u>Arctic Grayling (<i>Thymallus arcticus</i>)</u>								
3	Akaitcho Lake 66°32'Nx115°53'W 18/8/77	7.62 7.62 10.16	30.0 39.0 44.0	250 670 900	9	M		Amphipoda
5	Wentzel Lake 66°09'Nx115°43'W 18/8/77	7.62	35.0	530	6	M		

Table 2. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
8	Unnamed Lake 66°39'N x 114°12'W 10/8/77	3.81	17.0	170	5		imm.	<i>Daphnia</i> sp.
<u>Round Whitefish (<i>Prosopium cylindraceum</i>)</u>								
2	Sloan River 66°36'N x 116°25'W 18/8/77	3.81	36.0	500	8	M	ripe and running	Gastropoda
		3.81	approx. same as above - damaged by gulls					
		3.81	28.0					
		3.81	28.0					
		7.62	37.0	525	7	M	ripe	
3	Akaitcho Lake 66°32'N x 115°53'W 18/8/77	7.62 10.16	41.0 36.0	580 480	9	F	near ripe	Gastropoda
8	Unnamed Lake 66°39'N x 114°12'W 10/8/77	3.81 3.81 3.81	24.0 23.5 24.5	125 100 100	5			

Table 2. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Longnose Sucker (<i>Catostomus commersoni</i>)</u>								
1	Junius Lake 66°27'N x 116°38'W 18/8/77	7.62 7.62	- 47.0	- 1600	gull	damaged		
2	Sloan River 66°36'N x 116°25'W 18/8/77	3.81 7.62 7.62	16.0 38.0 -	50 1800 -	gull gull	damaged damaged		
3	Akaitcho Lake 66°32'N x 115°53'W 18/8/77	10.16	44.0	1200				
5	Wentzel Lake 66°09'N x 115°43'W 18/8/77	7.62 7.62 7.62	30.0 37.0 37.0	350 650 1650	M F gull			
<u>Burbot (<i>Lota lota</i>)</u>								
3	Akaitcho Lake 66°32'N x 115°53'W 18/8/77	7.62 10.16	45.0 56.0	480 960	16			

Table 2. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<i>Coregonus</i> sp.								
5	Wentzel Lake 66°09'Nx115°43'W 18/8/77	gut	several	specimens	in lake trout stomach			

NORTHWEST GREAT SLAVE LAKE DRAINAGES

General

This area includes the Acasta River, the Emile and Yellowknife rivers, and the Indin River and its tributaries, the Snare and Winter rivers (Fig. 3). All these rivers are within the tree line and all are bordered by spruce, brush, moss, and grass. Their banks are often eskers and their bottoms are of rock, sand and mud. The area of Indin Lake and the Snare River has been subject to intensive fisheries research as a result of hydro projects proposed for the Snare River. More detailed information is available from the Fisheries and Marine Service, Winnipeg, Manitoba (K. T. Chang-Kue). Winter Lake, the site of Franklin's Fort Enterprise, has also been sampled and information is available in the journals of Franklin (1969), Back (1970) and Hood (1974).

Aquatic Resources

This area, particularly the upper Snare River, is very productive. Pike abound in the lush aquatic vegetation and appear to have out-competed the lake trout. Fish were generally more abundant and diverse than in sampling areas further east and north. Sampling Data can be found in Tables 3 and 4.

Domestic and Commercial Fishing

There is domestic fishing on both the Snare and Indian rivers and on Indin Lake. It is often conducted in conjunction with hunting and trapping activities, providing food for canine and human consumption. Indin Lake was commercially fished briefly during the winter of 1963-64 producing 40 kg rnd. (104 lb) of lake trout. At that time it had a quota of 45,440 kg rnd. (115,542 lb). Arseno Lake has a surface area of 69.4 sq km (9,856 acre) and a commercial quota for lake

trout and whitefish of 13,620 kg rnd. (30,000 lb). It was last fished in 1966 yielding 2,177 kg rnd. (4,800 lbs) of whitefish and 999 kg rnd (2,200 lb) of lake trout. It was open but not fished in 1974.

Mattberry Lake (64 05'N, 115 45'W) has a commercial quota for lake trout and whitefish of 32,234 kg rnd. (71,000 lb). It was opened in 1966, yielding 4,994 kg rnd. (11,000 lb) of whitefish and 11,350 kg rnd. (24,000 lb) of lake trout and was open and probably fished in 1972. It is due to open again in 1978.

Basler Lake (65 00'N, 115 51'W) is a 105 sq. km. (26,240 acre) lake with a commercial quota for lake trout and whitefish of 35,412 kg rnd. (78,000 lb). Fished in 1966, 1,452 kg rnd. (3,200 lb) of whitefish and 10,442 kg rnd. (23,000 lb) of lake trout were taken.

FIGURE 3: N.W.GREAT SLAVE LAKE DRAINAGE SYSTEM

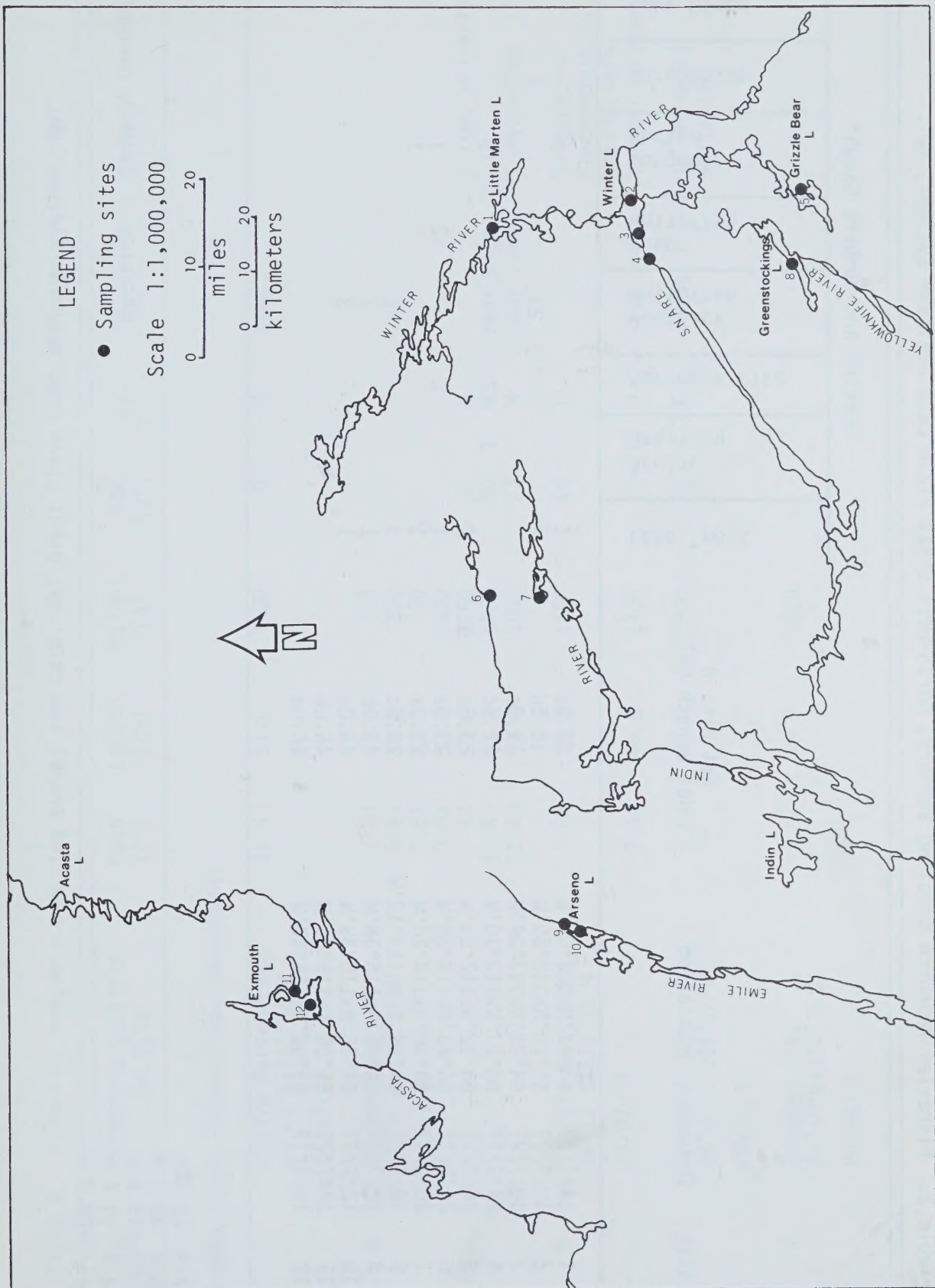


Table 3. Fisheries resource sampling summary, North-West Great Slave Lake Drainage Systems, NWT.

Set	Date	Location	Set Hrs. & Net Length (m)	Species and Numbers Caught									
				Lake Trout	Arctic Grayling	Northern Pike	Humpback Whitefish	Round Whitefish	Longnose Sucker	Coregonids	Lake Cisco		
1	24/7/77	64°42'Nx113°04'W	25.5a	1									
2	10/7/77	64°28'Nx112°55'W	18.5d	7			21			3		3	
3	10/7/77	64°28'Nx113°04'W	19.0c										
4	24/7/77	64°27'Nx113°10'W	22.5c		3	2				15			
5	24/7/77	64°12'Nx112°55'W	23.0a	2									
6	20/8/77	64°43'Nx114°28'W	23.0a	1		2			2	1			
7	20/8/77	64°40'Nx114°28'W	23.0a	1						1			
8	10/7/77	64°27.5'Nx113°12'W	20.5c	3									
9	12/7/77	64°36'Nx115°38'W	45.0b	1					2				
10	12/7/77	64°35'Nx115°39'W	45.0d	1					1				
11	12/7/77	65°00'Nx115°54'W	46.0b	1					3				
12	12/7/77	65°02'Nx115°53'W	46.0d										2

a = 22.8 m
b = 18.3 m
c = 45.6 m
d = 91.4 m
e = 109.7 m

Table 4. Fisheries resource sampling survey raw data, NWT Great Slave Lake drainage systems, NWT.

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Lake trout (<i>Salvelinus namaycush</i>)</u>								
1	Little Marten Lake 64°42'Nx113°04'W 24/07/77	11.43	51.0	1400	9	M	spent	-
2	Winter Lake 64°28'Nx112°55'W 10/07/77	3.81 3.81 3.81 3.81 7.62 11.43 11.43	23.0 32.5 22.0 52.5 50.0 53.0 53.0	120 250 130 1580 1280 1680 1900				
					39	M	-	2 lge. whitefish
					20	M	near ripe	
					27	M	near ripe	1 whitefish
5	Grizzle Bear Lake 64°12'Nx112°55'W 24/07/77	7.62	54.0	1550	18	F	-	Tricoptera, Ephemeroptera, Lepidoptera Unknown minnow
6	Unnamed lake 64°43'Nx114°28'W 20/08/77	7.62	45.5	1100	14	M	ripe	
		7.62	62.0	2500	29	F	spent	12 cm round whitefish
7	Unnamed lake 64°40'Nx114°28'W 20/08/77	7.62	69.0	3600				

Table 4. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
8	Greenstockings Lake 64°27.5'Nx113°12'W 10/07/77	7.62 7.62 7.62	38.0 67.0 49.5	580 3200 1400				
9	Arseno Lake 64°36'Nx115°38'W 12/07/77	3.81	52.0	1500				
10	Arseno Lake 64°35'Nx115°39'W 12/07/77	10.16	51.0	1300	21	M	near ripe	-
<u>Arctic Grayling (<i>Thymallus arcticus</i>)</u>								
4	Snare River 64°27'Nx113°10'W 24/07/77	7.62 7.62 10.16	39 43 45	800 1050 1000	8 10 9	F M M	- - -	- - -
<u>Northern Pike (<i>Esox lucius</i>)</u>								
4	Snare River 64°27'Nx113°10'W 24/07/77	7.62 10.16	66 61	2400 1700	6	M	-	-

Table 4. (Cont'd.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
6	Unnamed lake 64°43'Nx114°28'W 20/08/77	7.62 7.62	79.0 54.5	4000 1150	11 4	M M	near ripe near ripe	- -
<u>Round whitefish (<i>Prosopium cylindraceum</i>)</u>								
6	Unnamed lake 64°43'Nx114°28'W 20/08/77	7.62 7.62	36.0 12.0	500 20	7	F	ripe	Pelecypoda
<u>Lake cisco (<i>Coregonus artedii</i>)</u>								
10	Arseno Lake 64°35'Nx115°39'W 12/07/77	3.81 3.81	21.5 20.0	120 90	4 5	M F	near ripe near ripe	- -
<u><i>Coregonus</i> sp.</u>								
2	Winter Lake 64°28'Nx112°55'W 10/07/77	gut	3 specimens in lake trout stomachs.					

Table 4. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Humpback whitefish (<i>Coregonus clupeaformis</i>)</u>								
2	Winter Lake 64°42'Nx113°04'W 10/7/77	3.81	15.2	60				
		3.81	18.4	80				
		3.81	16.8	70				
		3.81	16.3	70				
		3.81	18.8	100				
		3.81	18.8	100				
		3.81	19.0	100				
		3.81	18.6	100				
		3.81	18.8	100				
		3.81	19.0	100				
		3.81	18.4	80				
		3.81	18.4	80				
		3.81	17.4	70				
		3.81	21.5	120				
		3.81	31.0	350				
		3.81	33.6	400				
		3.81	33.8	400				
		3.81	31.4	380				
		3.81	30.0	300				
		3.81	31.4	380				
		3.81	30.0	300				
8	Greenstockings Lake 64°27.5'Nx113°12'W 10/7/77	7.62	43.5	1200				
		7.62	52.2	2000	10	M	-	Chironomidae, Pelecypoda

Table 4. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
9	Arseno Lake 64°36'Nx115°38'W 12/7/77	13.97	52.5	2300				
10	Arseno Lake 64°35'Nx115°39'W 12/7/77	7.62 7.62 10.16	55.0 57.2 54.0	2200 2440 1920	13 -	F F	near ripe near ripe	Amphipoda Amphipoda
<u>Longnose Sucker (<i>Catostomus commersoni</i>)</u>								
1	Little Marten Lake 64°42'Nx113°04'W 24/7/77	11.43 11.43 11.43	45.0 53.0 48.0	1430 1900 1360				
4	Snare River 64°27'Nx113°10'W 24/7/77	7.62 7.62 7.62 7.62 7.62 7.62 7.62 10.16 10.16 10.16 10.16 10.16 10.16 10.16	44.0 49.0 47.0 37.0 44.0 44.0 45.0 40.0 48.0 39.0 37.0 47.0 39.0 44.0 40.0	1100 1200 1300 800 1100 1100 1200 760 1220 800 700 1400 800 900 1000		F M F M M		

Table 4. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
6	Unnamed Lake 64°43'Nx114°28'W 20/8/77	7.62	37.0	600				
7	Unnamed Lake 64°40'Nx114°28'W 20/8/77	7.62	36.0	700				

COPPERMINE RIVER SYSTEM

General

This drainage system was the longest studied (Fig. 4). It encompasses the Coppermine River and its tributaries the Hepburn, Starvation and Fairy Lake rivers. Large lakes draining into the Coppermine include Lac du Sauvage, Lac de Gras, Lake Providence, Yamba, Point, Redrock, Itchen, and Takijuq. At the outlet of Point Lake, the Coppermine has a mean daily discharge of 1.20 cubic meters/sec. (42.4 cfs) from a drainage area of 20,280 sq. km (7,830 sq mi) (Water Survey on Canada 1976). The water is clear and cold in the large lakes and rivers until the Big Bend of the Coppermine where it becomes very silty. The area from Point Lake northeast and northwards along the Coppermine is within the tree line and the rivers and lake shores are lined with small spruce trees, mosses, brush, and grasses. The bed of the lower Coppermine consists of sand or mud.

With the exceptions of Redrock and Point lakes, the large lakes are surrounded mainly by bedrock with only sparse moss or low brush on the shores. Their bottoms are rock and mud. Rawalpindi, Grenville, and Drumlin lakes also had bare shores but these clear lakes had sand bottoms and sand or rock shorelines.

The Coppermine has been used for transportation to the Arctic Ocean for centuries and there are records of early scientific expeditions to be found in the explorers' journals. Samuel Hearne, in July 1771, was the first European to descend to the mouth of the Coppermine. He was followed in 1821 by Sir John Franklin's first expedition that reached Coppermine on July 18. The journals of both expeditions and their successors contain the first observations on the area's flora and fauna. Recently, the 1959 Fisheries Survey sampled Redrock Lake and

Vaillant Lake (Johnson 1976).

Aquatic Resources

The lower Coppermine has a greater fish species diversity than any other area surveyed excepting perhaps Great Bear Lake (Table 5). Arctic char migrate up the Coppermine to spawn, passing the Big Bend in early August. The fish caught in Takijuq Lake, and the other large lakes were often large and very old.

Domestic and Commercial Fishing

Belanger Lake had a commercial quota on lake trout and whitefish of 3,632 kg rnd. (8000 lb) but was closed during the 1977-78 season. The Arctic char run up the Coppermine has been estimated at less than 15,000 fish (pers. comm. B. Golke). There are no commercial quotas and fishing at the mouth of the Coppermine is entirely domestic. Sampling Data can be found in Tables 5 and 6.

FIGURE 4: COPPERMINE RIVER SYSTEM

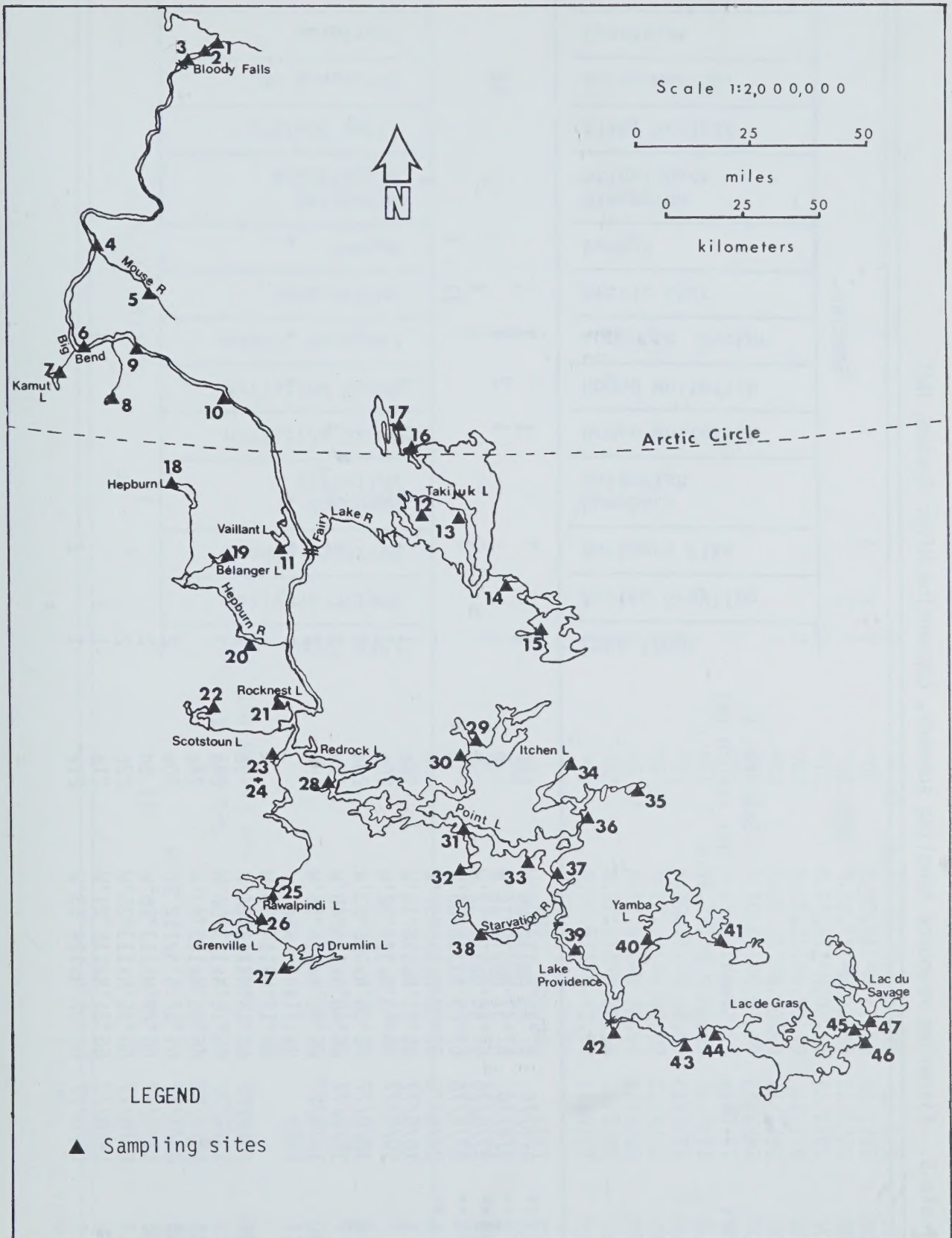


Table 5. Fisheries resource sampling summary, Coppermine River System, NWT.

Set	Date	Location	Set Hrs. & Net Length (m)	Species														
				Lake Trout	Arctic Grayling	Northern Pike	Humpback Whitefish	Broad Whitefish	Round Whitefish	Longnose Sucker	Arctic Char	Burbot	Ninespine Stickleback	Stimy Sculpin	Coregonus sp.	Cyprinids	Lake Cisco	
1**	1/8/76	67°48'Nx115°06'W	14b	1				1	1	7	1							
2**	9/8/76	67°47'Nx115°10'W	h					1	2	4						10		
3**	27/6/76	67°46'Nx115°17'W	h								4							
4**	27/6/76	67°09'Nx116°05'W	h								11	1						
5**	27/6/76	67°00'Nx115°37'W	h										1					
6	10/8/77	66°48'Nx116°13'W	16c	1	2	1	3	11	4									
7	10/8/77	66°43'Nx116°22'W	20b	2			5											
8	18/8/77	66°38'Nx115°53'W	20a	3	1	2	1	3										
9	10/8/77	66°48'Nx115°40'W	17a	3												2	9	
10	10/8/77	66°40'Nx114°58'W	19a	2	*	*	*		*	*	*						1	
11	1959	Vaillant Lake		*														
12	13/7/77	66°13'Nx114°30'W		1														
13	10/8/77	66°16'Nx113°24'W	9d	3														
14	10/8/77	66°16'Nx113°00'W	23a															
15	10/8/77	66°05'Nx112°43'W	24a						1									
16	23/7/77	65°52.5'Nx112°26'W	20a	2														
17	13/7/77	66°29'Nx113°26'W	11.5d	2			1											
18	10/8/77	66°35'Nx113°35'W	22b	2														
19	18/8/77	66°21'Nx115°21'W	21a	1	1													
19	18/8/77	66°07'Nx114°53'W	21a	1		2												

Table 5. (Con't.)

Set	Date	Location	Set Hrs. & Net Length (m)		Species													
			Lake Trout	Arctic Grayling	Northern Pike	Humpback Whitefish	Broad Whitefish	Round Whitefish	Longnose Sucker	Arctic Char	Burbot	Ninespine Stickleback	Slimy Sculpin	Coregonus sp.	Cyprinids	Lake Cisco		
20	17/8/77	65°53'Nx115°05'W	78b		9						1							
21	17/8/77	65°42'Nx114°26'W	49a	4	1						2							
22	18/8/77	65°38'Nx115°03'W	80a	4	1	*	*	*	*	*	6							
23	1959	Redrock Lake		*		*	*	*	*	*	*							
		65°28'Nx114°28'W																
24	17/8/77	65°28'Nx114°28'W	48c	13			2							1	1	1		
25	18/8/77	65°02'Nx114°32'W	22c	6					3	1								
26	20/8/77	64°57'Nx114°34'W	22.5a	5		1				1								
27	20/8/77	64°50'Nx114°23'W	22.5a	2									3					
28	13/8/77	65°25'Nx114°02'W	15a	3													10	
29	13/8/77	65°30.5'Nx112°55'N	19a															
30	13/8/77	65°28'Nx112°57'N	18c	1														
31	24/7/77	65°16'Nx113°01'W	24.5b															
32	24/7/77	65°06'Nx112°58'W	23a	1														
33	9/7/77	65°08'Nx112°32'W	24b	2														
34	23/7/77	65°26'Nx112°13'W	21b	2														
35	22/7/77	65°20'Nx111°42'W	22a	1	1					1								
36	23/7/77	65°17'Nx112°06'W	20a	1	1	1												
37	9/7/77	65°04.5'Nx112°22'W	24.5d	8						1	1				1	1	4	

Table 5. (Con't.)

Set	Date	Location	Set Hrs. & Net Length (m)	Species														
				Lake Trout	Arctic Grayling	Northern Pike	Humpback Whitefish	Broad Whitefish	Round Whitefish	Longnose Sucker	Arctic Char	Burbot	Ninespine Stickleback	Slimy Sculpin	<i>Coregonus</i> sp.	Cyprinids	Lake Cisco	
38	24/7/77	65°54'Nx112°55'W	25.5b	7	1													
39	23/7/77	64°51'Nx112°10'W	18a	1		1									1			
40	22/7/77	64°52'Nx111°36'W	18c	1														
41	21/7/77	64°52'Nx111°05'W	17f												1			
42	23/7/77	64°37.5'Nx111°57'W	16c	1	11	1												
43	21/7/77	64°33'Nx111°17'W	16c	4	1	1												
44	9/7/77	65°34'Nx111°08'W	23d	2														
45	20/7/77	64°33'Nx110°10'W	18.5a															
46	8/7/77	64°33'Nx110°02'W	23d															
47	20/7/77	64°34'Nx111°03'W	19.5c	7	1										1			

*Johnson 1976

**Sutherland and Golke 1976

a = 22.8 m

b = 18.3 m

c = 45.6 m

d = 91.4 m

e = 109.7 m

f = 36.6 m

h = seining

Table 6. Fisheries resource sampling survey raw data, Coppermine River System, NWT.

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Lake Trout (<i>Salvelinus namaycush</i>)</u>								
1	Coppermine R. - 1.6 km upstream of mouth 67°48'Nx115°06'W 1/8/76	8.89	one specimen - no data collected					
6	Coppermine R. - Big Bend 66°48'Nx116°13'W 10/8/77	11.43	68.0	3700				
7	Kamut Lake 66°43'Nx116°20'W 10/8/77	mixed mesh	42.5 56.0	700 1600				
8	Unnamed Lake 66°38'Nx115°53'W 18/8/77	8.89 8.89 8.89	57.5 58.5 44.5	2030 1880 920	12 18	M F	spent spent	Unidentified fish Unidentified fish
9	Coppermine River 66°48'Nx115°40'W 10/8/77	10.16 10.16 10.16	86.0 68.0 67.0	7100 2800 2750	15 11	F F	- -	2 Coregonids, 2 Cyprinids 6 Cyprinids

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
10	Coppermine River 66°40'N x 114°57'W 10/8/77	8.89	55.0	1400	23	F	-	1 Trout minnow, 1 Cyprinid
11	*Vaillant Lake 66°13'N x 114°30'W 1959	3.81-13.97 160 lake trout caught in 1959 (Johnson 1976).						
12	Takijuq Lake 66°16'N x 113°24'W 13.7.77	7.62	65.5	3200				
13	Takijuq Lake 66°16'N x 113°00'W 10/8/77	11.43 11.43 11.43	48.0 76.0 106.0	1400 4500 9700	56	M		Trichoptera
15	Unnamed Lake 65°52.5'N x 112°26'W 23/7/77	10.16 10.16	52.0 70.0	1450 3600	22	M	spent	
16	Takijuq Lake 66°29'N x 113°26'W 13/7/77	7.62 7.62	77.5 107.0	3600 12000				

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
17	Unnamed Lake 66°35'Nx113°35'W 10/8/77	mixed mesh	53.0 26.0	1600 140	9		imm.	
18	Hepburn Lake 66°21'Nx115°21'W 18/8/77	10.16	61.0	1900				External segmented parasites
19	Bélanger Lake 66°07'Nx114°53'W 18/8/77	11.43	50.0	1400	13	M	ripe and running	
21	Rocknest Lake 65°42'Nx114°26'W 17/8/77	10.16 10.16 10.16	70.5 55.0 61.0	2550 1600 1920	19 18	M F	spent spent	1 sucker 2 ninespine stickleback
		10.16	56.0	1500	26	M	spent	-
22	Scotsoun Lake 65°38'Nx115°03'W 18/8/77	10.16 10.16 10.16 10.16	73.0 74.0 54.0 49.0	3600 4400 1720 1320				Trichoptera
					14 18	F F		

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
23	Redrock Lake 65° 28' N x 114° 28' W 1959		trout reported (Johnson 1976)					
24	Redrock Lake 65° 28' N x 114° 28' W 17/8/77	11.43	69.0	3200				
		11.43	59.0	2180				
		11.43	52.5	1480	21	M	spent	Coleoptera
		11.43	58.0	1900	19	M	spent	Plecoptera
		11.43	57.5	1760	19	F	spent	
		11.43	56.0	1850	18	M	spent	
		7.62	61.0	2100				
		7.62	63.0	2350				
		7.62	63.0	2300	28	M	spent	Coleoptera
		7.62	56.0	1680	-	F	spent	Unidentified minnows
		7.62	59.5	2400	32	M	spent	Flies
		7.62	60.0	2320	33	M	spent	1 ninespine stickleback,
								1 coregonid
		7.62	55.5	1820	32	F	spent	1 slimy sculpin

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
25	Rawalpindi Lake 65°02'N x 114°32'W 18/8/77	10.16	62.0	2500	24	M	spent	
		10.16	65.0	2500	22	M	ripe and running	
		10.16	59.0	2200				
		10.16	35.5	500	10	imm.		
		10.16	59.0	2200	16	F	spent	3 round whitefish
26	Grenville Lake 64°57'N x 114°34'W 20/8/77	10.16	56.0	1660				
		8.89	70.0	3600	30	F	spent	
		8.89	60.0	1800	32	M	spent	
		8.89	63.0	2700	29	F	spent	
		8.89	61.0	2820	45	M	spent	
27	Drumlin Lake 64°50'N x 114°23'W 20/8/77	8.89	54.0	1550	29	M	spent	3 burbot
		7.62	69.0	3600	32	F	ripe and running	
		7.62	59.0	1750	24	F	spent	
28	Redrock Lake 65°25'N x 114°02'W 13/8/77	8.89	81.0	5800				
		8.89	50.0	1520	13	F		
		8.89	48.0	1180	13	M	ripe	Diptera larvae
30	Itchen Lake 65°28'N x 112°57'W 13/8/77	7.62	40.5	700	14	F		

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
32	Unnamed Lake 65 06'Nx112 58'W 24/7/77	7.62	54.0	1950	18	M	spent	
33	Point Lake 65 08'Nx112 32'W 9/7/77	12.70 12.70	558.0 106.0	468 11500				
34	Unnamed Lake 62 26'Nx112 13'W 23/7/77	7.62 7.62	80.0 54.0	4400 1650	28	M		Trichoptera, Hemiptera, Ephemeroptera
36	Unnamed River 65 17'Nx112 06'W 23/7/77	7.62	50.0	1240	24	M		Unidentified fish
37	Coppermine River 65 05'Nx112 22'W 9/7/77	3.81 3.81 7.62 7.62 7.62 7.62 7.62 11.43	55.0 55.0 57.0 70.5 55.0 58.0 54.0 61.0	1700 1700 1980 3200 1480 1840 1880 2720				
					23	F	near ripe	1 small whitefish

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
38	Starvation River 65°54'Nx112°55'W 24/7/77	3.81 5.08 7.62 7.62 10.16 10.16 12.70	37.0 37.0 35.0 47.0 47.0 43.0 49.0	680 760 725 1350 1400 1050 1520				
39	Lake Providence 64°51'Nx112°10'W 23/7/77	10.16	60.0	3150				
40	Channel between Daring Lake and Yamba Lake 64°52'Nx111°36'W 22/7/77	8.89	47.0	1400	10	imm.		
42	Coppermine River 64°37.5'Nx111°57'W 23/7/77	7.62	51.0	1750	13	M	spent	Small mammal
43	Coppermine River 64°33'Nx111°17'W 21/7/77	7.62 7.62 8.89 8.89	91.0 65.0 51.0 44.0	7700 2580 1300 1000	11	imm.		Gastropods, Diptera larvae

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
44	Lac de Gras 65°34'N x 111°08'W 9/7/77	7.62	77.5 84.0	5300 6300				
47	Channel between Lac de Gras and Lac du Savage 64°33'N x 110°02'W 20/7/77	7.62 7.62 10.16 10.16 10.16 10.16	63.0 70.0 57.0 71.5 62.0 60.0 61.0	2900 2820 2020 3800 2900 2100 2220	19 27 33 27 28	M F M F M	near ripe ripe spent near ripe	Cleoptera, Diptera larvae 14" whitefish 14" fish
35	Unnamed Lake 65°20'N x 111°42'W	11.43	43.0	800	16		imm.	
<u>Arctic Grayling (<i>Thymallus arcticus</i>)</u>								
7	Kamut Lake 66°43'N x 116°20'W 10/8/77	mixed mesh	40.0 38.0	750 700		F		

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
9	Coppermine River 66°48'N x 115°40'W 10/8/77	-	gut sample from lake trout					
11	Vaillant Lake 66°13'N x 114°30'W 1959	3.81-13.97	24	Arctic grayling caught in 1959 (Johnson 1976).				
18	Hepburn Lake 66°21'N x 115°21'W 18/8/77	10.16	40.0	780				
22	Scotstoun Lake 65°38'N x 115°03'W 18/8/77	10.16	34.0	400	5			
35	Unnamed Lake 65°20'N x 111°42'W 22/7/77	11.43	40.5	850				
36	Unnamed River 65°17'N x 112°06'W 23/7/77	7.62	36.0	700				

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
38	Starvation River 65°54'Nx112°55'W 24/7/77	3.81	25.5	220	-	F		
42	Coppermine River above rapids at south end of Lake Providence 64°37.5'Nx111°57'W 23/7/77	7.62	41.0	830				
		7.62	32.0	430				
		7.62	31.5	400				
		7.62	42.5	760				
		7.62	39.0	640				
		7.62	40.5	750				
		7.62	41.0	800				
		7.62	40.0	830				
		7.62	33.0	450	4	F	-	Ephemeroptera
		7.62	40.5	725	6	M	spent	Small mammal
		7.62	41.5	800	8	M	-	-
43	Coppermine River 64°33'Nx111°17'W 21/7/77	7.62	38.0	700				
47	Channel between Lac de Gras and Lac du Savage 64°33'Nx110°02'W	7.62	41.5	980	9	F	ripe	Daphnia sp.

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
Northern Pike (<i>Esox lucius</i>)								
6	Coppermine R. - Big Bend 66°48'Nx116°13'W 10/8/77	7.62	59.0	1780				
9	Coppermine River 66°48'Nx115°40'W 10/8/77	8.89 8.89	70.0 60.0	2200 1800	8	M		1 large Arctic grayling
11	Vaillant Lake 66°13'Nx114°30'W 1959	3.81-13.97 3 northern pike caught in 1959 (Johnson 1976)						
19	Belanger Lake 66°07'Nx114°53'W 18/8/77	11.43 11.43	86.0 88.0	6200 4700	19	F		
20	Hepburn River 65°54'Nx114°44'W 17/8/77	11.43 11.43 11.43 11.43 11.43 11.43 11.43 11.43 11.43	73.0 54.0 70.0 57.0 69.0 67.0 71.0 61.0 62.0	3200 1220 2400 1500 2900 2150 1650 1680 1500	7 4 13 5 6 8 7	F F M F M F F M	Unidentified fish	

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
21	Rocknest Lake 65°42'Nx114°26'W 17/8/77	10.16	86.0	5000	14	F		
23	Redrock Lake 65°28'Nx114°28'W 1959	13.97	89.6	5280, caught in 1959 (Johnson 1976)				
25	Grenville Lake 64°57'Nx114°34'W 20/8/77	8.89	56.0	1350	6	M	near ripe	3 burbot
36	Unnamed River 65°17'Nx112°06'W 23/7/77	7.62	50.0	980				
39	Lake Providence 64°51'Nx112°10'W 23/7/77	10.16	67.0	1980	7	M	spent	<i>Coregonus</i> sp.
42	Coppermine River 64°37.5'Nx111°57'W 23/7/77	7.62	76.5	2600	14	M		

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
43	Coppermine River 64°33'N x 111°17'W 21/7/77	7.62	71.0	2700	7	F		
<u>Humpback Whitefish (<i>Coregonus clupeaformis</i>)</u>								
6	Coppermine R. - Big Bend 66°48'N x 116°13'W 10/8/77	11.43 11.43 11.43	41.0 40.0 40.0	1000 820 820	13 12 11	M M F	spent spent spent	Gastropods Gastropods Gastropods
7	Kamut Lake 66°43'N x 116°20'W 18/8/77	mixed mesh	41.0 51.0 44.0	960 2940 1250	14 14	M M	ripe ripe and running ripe	Gastropods Bivalves Gastropods and Bivalves <i>Daphnia</i> sp. Gastropods
9	Coppermine River 66°48'N x 115°40'W 10/8/77		45.5 28.0	1420 300	15 7	F F		
11	Vaillant Lake 66°13'N x 114°30'W 10/8/77		44.0	1270	12	F		
		3.81-13.97	476 humpback whitefish in 1959 (Johnson 1976)					

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
16	Takijuk Lake 66°29'Nx113°26'W 13/7/77	7.62	62.5	3000				
23	Redrock Lake 65°28'Nx114°28'W 1959	3.81-13.97	140	humpback whitefish in 1959 (Johnson 1976)				
24	Redrock Lake 65°28'Nx114°28'W 17/8/77	11.43 11.43	60.0 43.5	3600 1000	18	F F	ripe spent	Gastropods Gastropods and Bivalves

Broad Whitefish (*Coregonus nasus*)

1	Coppermine R. - 1.6 km upstream of mouth 67°48'Nx115°06'W 1/8/76	8.89	one specimen - no data collected					
2	Coppermine R. - 6.4 km upstream of mouth 67°46'Nx115°13'W 9/8/76	seine	one specimen - no data collected					

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
6	Coppermine R. - Big Bend 66°48'N x 116°13'W 10/8/77	7.62 7.62 7.62 7.62 11.43 11.43 11.43 11.43 11.43 11.43 11.43	36.0 33.0 34.0 38.0 39.0 40.0 41.0 39.0 35.0 41.0 40.0	500 350 450 780 700 750 900 700 500 780 800	6	imm.		
23	Redrock Lake 65°28'N x 114°28'W 1959	3.81-13.97	10	specimens caught in 1959 (Johnson 1976)				
<u>Round Whitefish (<i>Prospium cylindraceum</i>)</u>								
2	Coppermine R. - 6.4 km upstream of mouth 67°48'N x 115°06'W 9/8/76	seine	2	specimens - no data collected				

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
6	Coppermine R. - Big Bend 66°48'Nx116°13'W 10/8/77	7.62 7.62 7.62 7.62	37.0 33.0 37.0 38.0	420 450 500 650				
11	Vaillant Lake 66°13'Nx114°30'W 1959	3.81-13.97	7	specimens collected in 1959 (Johnson 1976)				
14	Unnamed Lake 66°05'Nx112°43'W 10/8/77	7.62	36.5	480	6	M	near ripe	
23	Redrock Lake 65°28'Nx114°28'W 1959	3.81-13.97	18	specimens collected in 1959				
25	Rawalpindi Lake 65°02'Nx114°32'W 18/8/77	-	3	specimens collected from lake trout stomachs				
37	Coppermine River 65°05'Nx112°22'W 9/7/77	7.62	28.0	230				

Table 6. (Con't.)

Site	Sampling Locations and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
43	Coppermine River 64°33'Nx111°17'W 21/7/77	8.89	46.0	1010				
46	Unnamed Lake 65°20'Nx111°42'W 8/7/77	-	40.0	630	13	F	-	Insect larvae
47	Channel between Lac de Gras and Lac du Savage 64°33'Nx110°02'W 20/7/77	10.16 10.16 10.16	55.5 56.0	2180 2050	17 13	F F	near ripe near ripe	
<u>Longnose Sucker (<i>Catostomus catostomus</i>)</u>								
1	Coppermine R. - 1.6 km upstream of mouth 67°48'Nx115°06'W 1/8/76	8.89					7 adult specimens - no data collected	
2	Coppermine R. - 6.4 km upstream of mouth 67°46'Nx115°13'W 9/8/76	seine					4 fry - no data collected	

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
25	Rawalpindi Lake 65°02'Nx114°32'W 18/8/77	7.62	36.0	520				
26	Grenville Lake 64°57'Nx114°34'N 20/8/77	8.89	49.0	1600				
27	Drumlin Lake 64°50'Nx114°23'W 20/8/77	7.62 7.62 7.62	50.0 50.0 50.0	1650 1920 1620				
37	Coppermine River 65°04.5'Nx112°22'W 9/7/77	7.62	33.4	440				
41	Yamba Lake 64°52'Nx111°05'W 21/7/77	12.70	44.0	1400				

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Arctic Char (<i>Salvelinus alpinus</i>)</u>								
1	Coppermine R. - 1.6 km upstream of mouth 67°48'Nx115°06'W 1/8/76	seine	one fry	- no data collected				
3	Coppermine River - just below Bloody Falls 67°45'Nx115°22'W 27/6/76	seine	four young	- no data collected				
4	Coppermine River at junction of Mouse R. 67°09'Nx116°05'W 27/6/76	seine	11 fry	(3.0 cm.) collected				
6	Coppermine R. - Big Bend 30/7/77-7/8/77							Arctic char reported in area for first week of August. Source: B.P. geology camp.

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Burbot (<i>Lota lota</i>)</u>								
4	Coppermine R. at junction of Mouse R. 67°09'Nx116°05'W 27/6/76	seine	one specimen (7.5 cm.)	collected				
11	Vaillant Lake 66°13'Nx114°30'W 1959	3.81-13.97	6 burbot caught in 1959 (Johnson 1976)					
26	Grenville Lake 64°57'Nx114°34'W 20/8/77		3 specimens in pike stomach					
39	Lake Providence 64°51'Nx112°10'W 23/7/77		7.5 cm. specimen collected by hand					
<u>Ninespine Stickleback (<i>Pungitius pungitius</i>)</u>								
5	Mouse River 67°00'Nx115°09'W 27/6/77	seine	unknown number of specimens taken, no data					

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
21	Rocknest Lake 65°42'Nx114°26'W 17/8/77	-						2 specimens in a lake trout stomach
24	Redrock Lake 65°28'Nx114°28'W 17/8/77	-						1 specimen in a lake trout stomach
39	Lake Providence 64°51'Nx111°10'W 21/7/77	-						1 specimen caught by hand
<u>Slimy Sculpin (<i>Cottus cognatus</i>)</u>								
24	Redrock Lake 65°28'Nx114°28'W 17/8/77	-						1 specimen in a lake trout stomach
<u>Lake Cisco (<i>Coregonus artedii</i>)</u>								
23	Redrock Lake 65°28'Nx114°28'W 1959	3.81-13.97						4 specimens collected in 1959 (Johnson 1976)

Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm.)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
25	Rawalpindi Lake 65°02'Nx114°32'W 18/8/77	10.16 10.16 10.16	31.0 31.0 30.5	300 300 300				
28	Redrock Lake 65°25'Nx114°02'W 13/8/77	8.89 8.89 8.89 8.89 8.89 8.89 8.89 8.89 8.89	37.5 38.5 39.5 38.0 37.0 35.5 39.0 38.5 38.0 58.0	700 680 620 650 620 520 720 720 680 1850	7 6	F	ripe	
37	Coppermine River 65°04.5'Nx112°22'W 9/7/77	3.81 3.81 3.81 3.81	18.7 19.2 18.8 20.0	80 80 90 100				

Coregonus Sp. (*Unidentified coregonids*)

2	Coppermine R. - 6.4 km upstream of mouth 67°46'Nx115°13'W 9/8/76	seine	10 specimens					
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Table 6. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
9	Coppermine River 66°48'Nx115°40'W 10/8/77	-	2 specimens in lake trout gut					
24	Redrock Lake 65°28'Nx114°28'W 17/8/77	-	1 specimen in lake trout gut					
37	Coppermine River 65°04.5'Nx112°23'W 9/7/77	-	1 specimen of whitefish in lake trout gut					
39	Lake Providence 64°51'Nx112°10'W 23/7/77	-	1 specimen of cisco in northern pike gut					
41	Yamba Lake 64°52'Nx111°05'W 21/7/77	seine	1 specimen of cisco					
47	Channel between Lac de Gras and Lac du Savage 64°33'Nx110°02'W 20/7/77	-	1 specimen of whitefish in lake trout gut					

NORTHEAST GREAT SLAVE LAKE DRAINAGES

General

This area contains many of the largest lakes in the sample area, including Clinton-Colden, Aylmer, MacKay, and Courageous lakes (Fig. 5), which drain into the northeast arm of Great Slave Lake via the Lockhart River. All of the lakes and rivers are clear and cold, with river bottoms generally of boulders and gravel. Lake bottoms in the shallows are of sand and rock with mud in the depths.

The banks of the lakes and rivers were covered with low bush or grass and occasionally bare rock or sand. At the outlet of Artillery Lake, the Lockhart River has a mean daily discharge of 98 cubic meters/second (3460 cfs) from a drainage area of 26,677 sq km (10,300 sq mi) (Water Survey of Canada 1976).

Vivid descriptions of these lakes and rivers exist in Franklin's (1969) and Back's (1970) journals. Ernest Thompson Seton (1943) also visited the area by canoe, writing about the experience in his book entitled, *The Arctic Prairies*.

Aquatic Resources

All of the large lakes in this area probably support populations of lake trout, Arctic grayling, round whitefish, lake cisco, burbot, longnose sucker, and ninespine stickleback. Clinton-Colden Lake was thoroughly surveyed in 1959 (Johnson 1976). The rivers and streams entering and leaving these lakes serve as spring and/or fall spawning sites and migrations routes for several species (see Appendix A.). Detailed sampling data may be found in Tables 7 and 8.

Commercial Fishing

McKay Lake is a 1,180 sq km lake (295,090 acre) with a commercial quota for

lake trout and whitefish of 401,790 kg rnd. (886,000 lb). It was closed during the 1977-78 season.

FIGURE 5: N.E.GREAT SLAVE LAKE DRAINAGES

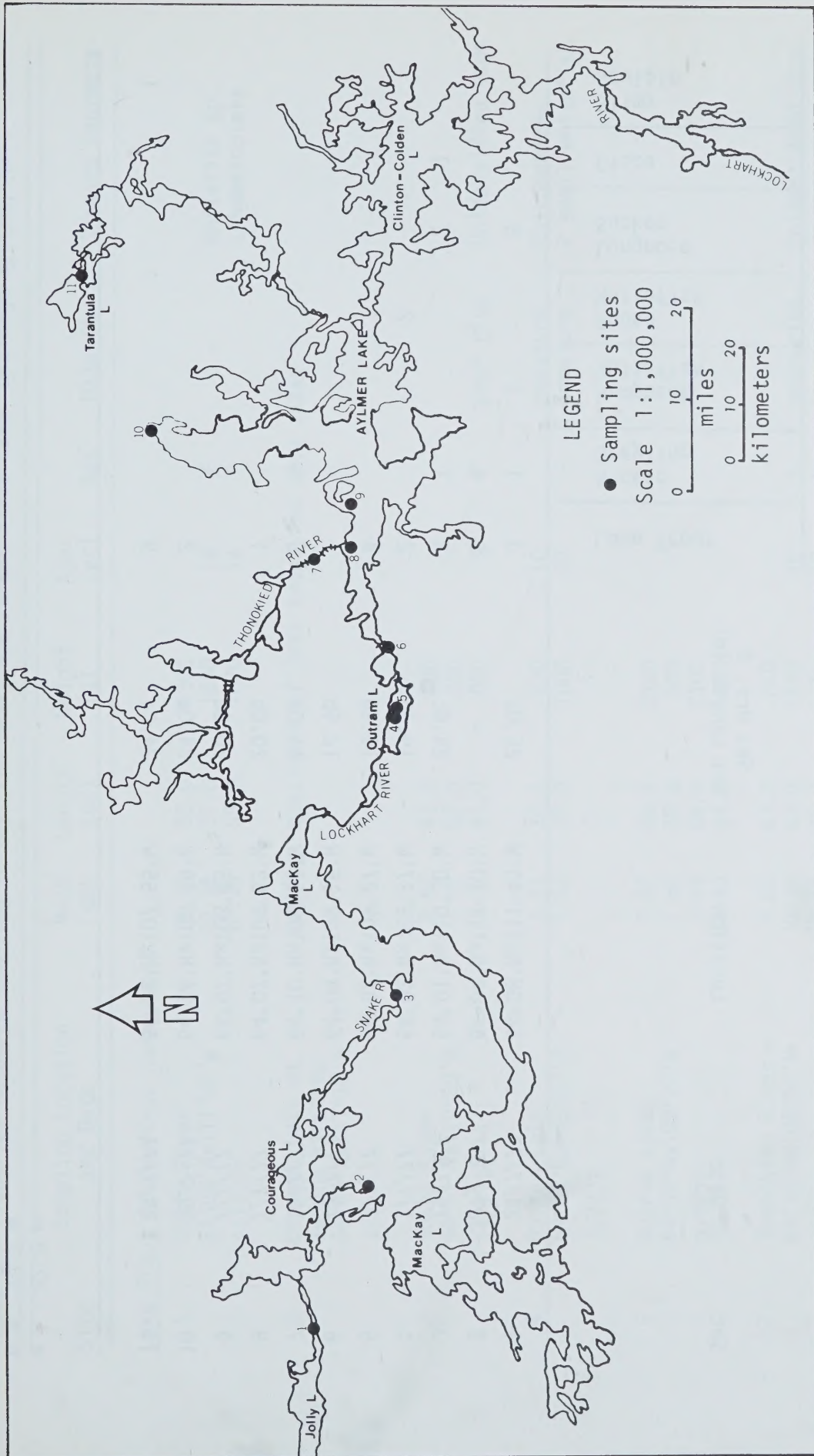


Table 7. Fisheries resource sampling summary, North-east Great Slave Lake Drainages, NWT.

Set	Date	Location	Set Hrs. & Net Length (m)	Species and Numbers Caught						
				Lake Trout	Arctic Grayling	Humpback Whitefish	Round Whitefish	Longnose Sucker	Cisco	Stimy Sculpin
1	24/7/77	64°08'Nx111°40'W	25.0a	3	1	1				
2	July 1977	64°04'Nx111°10'W	-	5	6					
3	19/7/77	64°01'Nx110°30'W	24.0c	3	1				2	1
4	7/7/77	64°02'Nx109°27'W	19.5b	2			2			
5	7/7/77	64°02'Nx109°27'W	19.5d	4			1			
6	18/7/77	64°04'Nx109°15'W	12.5b							
7	18/7/77	64°10'Nx108°57'W	11.0b	5	3					
8	7/7/77	64°07'Nx109°52'W	20.0b	1						
9	7/7/77	64°07'Nx108°45'W	20.0d							
10	19/7/77	64°24'Nx108°29'W	24.0a	2						
11	28/7/77	64°32'Nx107°55'W	24.0a	9						1

a = 22.8 m
b = 18.2 m
c = 45.6 m
d = 91.4 m

Table 8. Fisheries resource sampling survey, raw data, N.E. Great Slave Lake Drainage System, NWT.

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
Lake Trout (<i>Salvelinus namaycush</i>)								
1	Jolly River 64°08'Nx111°40'W 24/7/77	10.16 10.16 10.16	86.0 57.0 55.0	5300 1850 1820	18 14	F F		Whitefish sp. Ephemeroptera
2	Unnamed Lake at Tundra airstrip 64°04'Nx111°10'N 7/77	angling specimens of lake trout, no data taken						
3	Snake River 64°01'Nx110°30'W 19/7/77	7.62 7.62 7.62	43.0 62.0 41.0	880 980 820	9	F	near ripe	Unidentified bugs
4	Outram Lake 64°02'Nx109°27'W 7/7/77	3.81 7.62	38.5 45.0	630 1000	10 10		immature immature	Chironomidae 2 small whitefish
5	Outram Lake 64°02'Nx109°27'W 7/7/77	7.62 7.62 7.62 11.43	60.4 38.0 56.4 64.0	2300 500 2100 1900				
7	Thonokied River 64°10'Nx108°57'W 18/7/77	7.62 10.16 10.16 12.70 13.97	43.0 47.0 48.0 59.5 69.0	840 1140 1520 2480 3000	10 10 21	F M M	near ripe immature near ripe	Unidentified fish Unidentified bugs

Table 8. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
8	Aylmer Lake 64°07'Nx109°52'W 7/7/77	7.62	73.5	3600				
10	Aylmer Lake Sand Hill Bay 64°24'Nx108°29'W 19/7/77	3.81 3.81	80.0 50.0	3200 1800				
11	Tarantula Lake 64°32'Nx107°55'W 28/7/77	10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16	51.0 69.0 51.0 68.0 51.0 50.0 50.0 62.5 57.0	1500 2640 1300 3200 1300 1380 1350 2080 1600	19 15 12 22 30 23	M F F M F	ripe ripe immature	Trichoptera Trichoptera Slimy sculpin Trichoptera
Arctic Grayling (<i>Thymallus arcticus</i>)								
1	Jolly River 64°08'Nx111°40'W 24/7/77	10.16	37.0	620	6	F		Ephemeroptera

Table 8. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
2	Unnamed Lake at Tundra airstrip 64°04'Nx111°10'W 7/7/77	angling	specimens of Arctic grayling, no data taken					
3	Snake River 64°01'Nx110°30'W 19/7/77	7.62	37.0	640	7	F	near ripe	Unidentified larvae
7	Thonokied River 64°10'Nx108°57'W 18/7/77	3.81 7.62 7.62	18.0 38.0 21.5	100 600 150	2 4 4	M M M		
<u>Humpback Whitefish (<i>Coregonus clupeaformis</i>)</u>								
1	Jolly River 64°08'Nx111°40'W 24/7/77	gut	stomach sample from lake trout					
<u>Round Whitefish (<i>Prosopium cylindraceum</i>)</u>								
4	Outram Lake 64°02'Nx109°27'W 7/7/77	3.81 7.62	30.5 32.0	300 300	5 5	F M		
5	Outram Lake 64°02'Nx109°27'W 7/7/77	7.62	39.5	600	7	M		Gastropoda

Table 8. (Con't.)

Site	Sampling Location and Date	Mesh (mm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Longnose Sucker (<i>Catostomus commersoni</i>)</u>								
1	Jolly River 64°08'Nx111°40'W 24/7/77	10.16 10.16 10.16	43.0 39.0 43.0	1000 820 1040		F M		
3	Snake River 64°01'Nx110°30'W 19/7/77	10.16 10.16	43.0 39.0	1000 800				
<u>Cisco (<i>Sub genus leucithys</i>) Species unknown</u>								
3	Snake River 64°01'Nx110°30'W 19/7/77	7.62	37.0	540				
<u>Slimy Sculpin (<i>Cottus cognatus</i>)</u>								
11	Tarantula Lake 64°32'Nx107°55'W 28/7/77	gut	taken from lake trout gut					

HOOD RIVER SYSTEM

General

The 210 km (130 mi) long Hood River and its two major tributaries, the James River 145 km (90 mi), and the Booth River, 65 km (40 mi), drain 11,914 sq km (4,600 sq mi) of barrens lying northeast of Takijuk Lake (Fig. 6) (Water Survey of Canada 1976). Cold, clear and rapid, these rivers flow over sand bars and gravel beds, between green hills and high sand bluffs. In its final descent to the sea, the Hood falls nearly 380 m (1250 ft) in only 32 km (20 mi), cutting through the Wilberforce Hills. Like all streams entering Bathurst Inlet from the west, it tumbles over the steep geological fault which borders the inlet. Water cascades 60-75 meters (200-250 ft) over the Hood's twin falls and then flows out over a broad delta into the Arctic Ocean.

Aquatic Resources

These rivers contain lake trout which were once domestically fished at many of the river junctions. The Inuit, who once fished and hunted these areas have now moved to the coast of Bathurst Inlet, moving inland only to trap and hunt. Arctic char may inhabit the Hood River below Wilberforce Falls but none were caught or reported above this high natural barrier to migration (see also Sutherland and Golke, 1978). Sampling Data from this survey are presented in Tables 9 and 10.

Charles Howard and Associates (Prof. Eng.) have also completed a *Preliminary Environmental Quality assessment of Bathurst Inlet Watersheds, N.W.T. (1977)*. This report may perhaps be obtained from the Dept. of Indian Affairs and Northern Development (Water Resources Branch, Ottawa).

FIGURE 6: HOOD RIVER SYSTEM

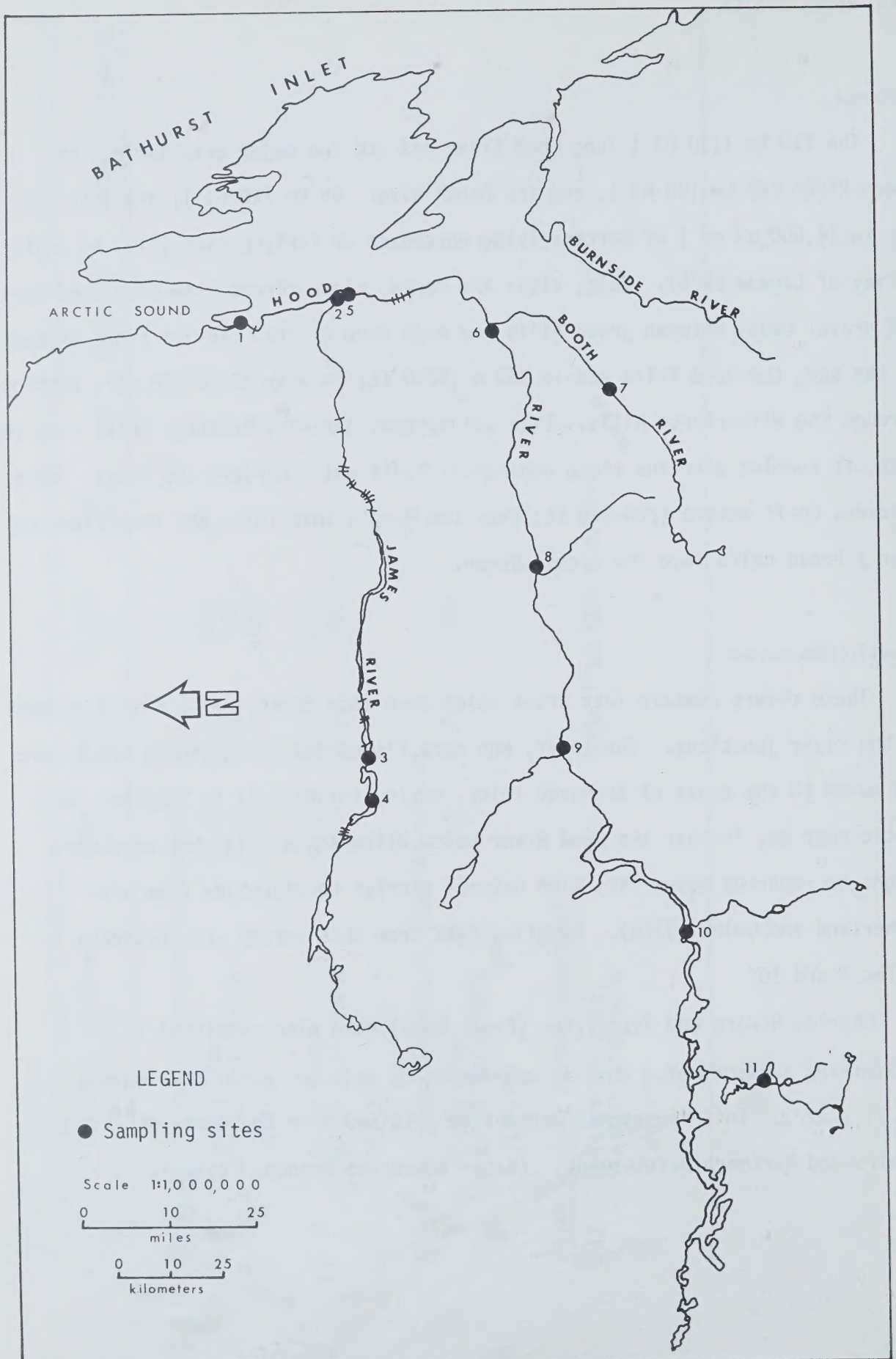


Table 9. Fisheries resource sampling summary, Hood River System, NWT.

Set	Date	Location	Set Time (Hrs) & Net Length (m)	Species and Numbers Caught				
				Lake Trout	Arctic Grayling	Round Whitefish	Broad Whitefish	Slimy Sculpin
1	8/7/76	67°23'Nx108°56'W	15 min. seine		18		6	6
2a	7/7/76	67°13'Nx108°47.5'W	15 min. seine		1			2
2b	9/8/76	67°13'Nx108°47.5'W	15 min. seine		2	2	2	
3	9/8/76	67°11'Nx110°47'W	46.5 hr., 3.5" mesh	7		2		
4	7/7/76	67°10'Nx110°57'W	24 hr., 3.5" mesh	5		1		
5	8/8/77	67°11.5'Nx108°48'W	27a	1			1	
6	8/8/77	66°58'Nx109°00'W	18a	3				
7	10/8/77	66°47'Nx109°12'W	33a	5				
8	10/8/77	66°54'Nx109°58'W	31c	14				
9	10/8/77	66°51'Nx110°43'W	29a	9		2		
10	10/8/77	66°39'Nx111°30'W	27b	10				
11	10/8/77	66°30'Nx112°05'W	26a	9				3

The 1976 information is from the 1976 Alur. survey.
(Sutherland and Golke 1978).

a = 22.8 m

b = 18.3 m

c = 45.6 m

d = 91.4 m

Table 10. Fisheries resource sampling survey raw data, Hood River System, NWT

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Lake trout (<i>Salvelinus namaycush</i>)</u>								
3	James River 67°11'Nx110°47'W 9/8/76	8.89	7	specimens, no data				
4	James River 67°10'Nx110°57'W 7/7/76	8.89	5	specimens, no data				
5	Junction Hood River and James River 67°11.5'Nx108°48'W 8/8/77	11.43	48.0	1220	24	F		
6	Junction Hood River and Booth River 66°58'Nx109°00'W 8/8/77	7.62 7.62 7.62	50.0 52.0 60.0	1050 1300 2150	20	M	spent	-
7	Booth River 66°47'Nx109°12'W 10/8/77	7.62 7.62 7.62	60.5 40.0 - - ≈40.0	2200 800 - - ≈800	33 21 gull damaged	M F	spent ripe and running	Gastropoda Gastropoda

Table 10. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
8	Hood River 66°54'Nx109°58'W 10/8/77	mixed mesh	63.0	2400				
			87.0	6200				
			87.0	6700				
			90.0	5300				
			76.0	3700				
			78.0	3700				
			43.0	880				
			49.0	1400				
			50.0	680				
			-	-				
9	Hood River 66°51'Nx110°43'W 10/8/77	8.89	89.0	7300	gull damaged 45	F		
			80.0	6200	47	M	ripe	
			44.0	830	20	F		
			42.0	760	21	M	ripe	
			40.0	720				
			44.0	1050				
			87.5	5800				
			40.0	770				
			63.0	2500				
			91.0	7100				
10	Hood River 66°39'Nx111°30'W 10/8/77	mixed mesh	57.0	2000	33	F	-	1 minnow
			55.0	1750	34	M	spent	
			45.0	1050				
			88.0	5300				
			46.0	1250				
			59.0	1800				

Table 10. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
10	Hood River (Con't.)		90.0	7500	47	M	spent	Trichoptera
			86.0	6200	30	M	spent	Trichoptera
			65.0	2700	15	F	spent	Trichoptera,
			45.0	1000	15	F	spent	3 minnows
			44.0	950				
			45.0	1100	13	M	ripe	
			43.5	900	19	M	ripe	
11	Unnamed Lake	7.62	58.0	1950				
	66°30'Nx112°05'W	7.62	72.0	3200				
	10/8/77	7.62	57.0	1800				
		7.62	69.0	3000				
		7.62	71.0	3200				
		7.62	49.0	1200				
		7.62	69.0	1800				
		7.62	65.0	2100	27	F		
		7.62	72.0	4500	46	M	ripe	

Arctic grayling (*Thymallus arcticus*)

1	Hood River 67°22'Nx108°54'W 8/7/76	seine	18 specimens taken
2a	James River 67°13'Nx108°49'W 7/7/76	seine	1 specimen taken

Table 10. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
2b	James River 67°13'Nx108°49'W 9/8/76	seine	2 specimens taken					
<u>Round whitefish (<i>Prosopium cylindraceum</i>)</u>								
2b	James River 67°13'Nx108°49'W 9/8/76	seine	2 specimens taken					
3	James River 67°11'Nx110°47'W 9/8/76	8.89	2 specimens taken					
4	James River 67°10'Nx110°57'W 7/7/76	8.89	1 specimen taken					
9	Hood River 66°51'Nx110°43'W 10/8/77	8.89 8.89	39.0 42.0	680	9	F	ripe	
<u>Broad whitefish (<i>Coregonus nasus</i>)</u>								
1	Hood River 67°22'Nx108°54'W 8/7/76	seine	6 specimens taken					
2b	James River 67°13'Nx108°49'W 9/8/76	seine	2 specimens taken					

Table 10. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
5	Junction Hood River and James River 67°115'Nx108°48'W 8/8/77	11.43	47.0	1320	9	F	ripe	
<u>Slimy sculpin (<i>Cottus cognatus</i>)</u>								
1	Hood River 67°22'Nx108°54'W 8/7/76	seine	6 specimens taken					
2a	James River 67°13'Nx108°49'W 7/7/76	seine	2 specimens taken					
10	Hood River 66°39'Nx111°30'W 10/8/77	gut	3 specimens in a lake trout gut					

BURNSIDE RIVER SYSTEM

General

This area includes the Burnside, 210 km long (130 mi); Mara, 161 km(100 mi); Hackett, 48 km (30 mi); and Icy rivers and Contwoyto, Pellat, Kathawachaga and Nose lakes (Fig. 7) (Water Survey of Canada 1976). The drainage area of the Burnside and its tributaries is 16,580 sq km (6,400 sq mi). It enters Bathurst Inlet over approximately a 10-meter (30-ft) fall which obstruct char movement.

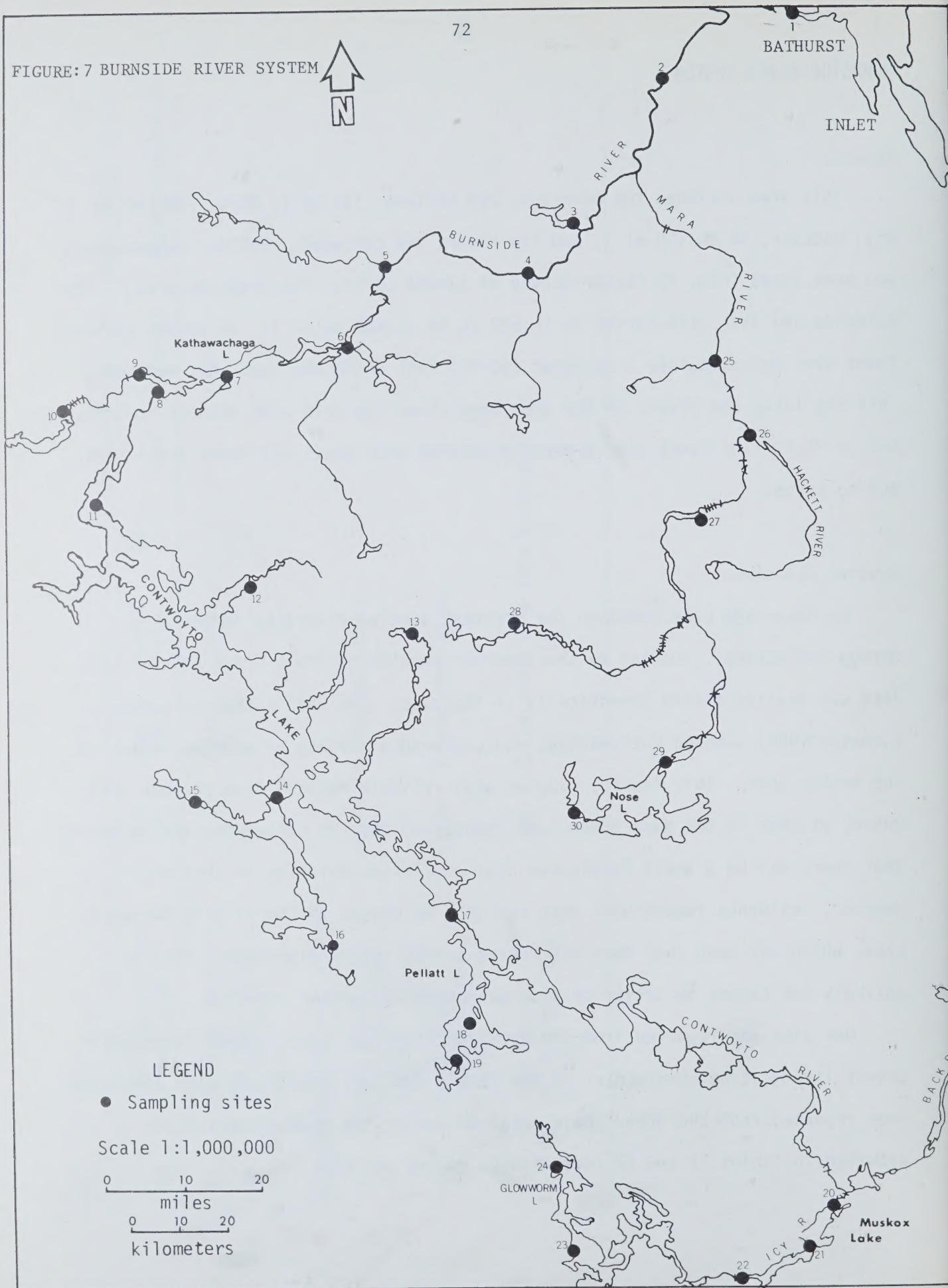
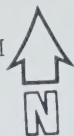
All the lakes and rivers in the area were clear and cold with bottoms of sand, mud or rock. The banks were generally covered with grass and short scrub bush, but no trees.

Aquatic Resources

Kathawachaga Lake produced the greatest species diversity in the area, during the survey. Judging by the numerous remains of Inuit stone houses, the lake was heavily fished domestically in the past. The 1959 Fisheries Survey (Johnson 1976) sampled Kathawachaga and captured a variety of species including one Arctic char. This report, coupled with reliable reports from trapper Neil Murphy of char in the Mara River, and reports of char in Contwoyto Lake, suggests that there may be a small landlocked char population existing in this area. However, residents report that char can only be caught in the fall in Contwoyto Lake, which may mean that char are making a long inland migration. This is unlikely but cannot be proven or disproven without further research.

One pike was reported from the Burnside River by Father Lamage, a catholic priest living at Bathurst Inlet in the 1930's (Walters 1953). No pike have since been reported from the area. Data obtained during the present survey are provided in Tables 11 and 12 (see also C. Howard pg. 63).

FIGURE: 7 BURNSIDE RIVER SYSTEM



LEGEND

- Sampling sites

Scale 1:1,000,000

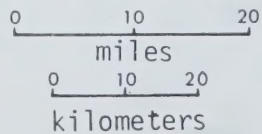


Table 11. Fisheries resource sampling summary, Burnside River System, NWT.

Set	Date	Location	Set Hrs. and Net Length (m)	Species and Numbers Caught							
				Lake Trout	Arctic Grayling	Round Whitefish	Longnose Sucker	Stimv Sculpin	Ninespine Stickleback	Lake Cisco	
1	8/8/77	66°53'Nx108°10'W	27.0a	3		1					
2	8/8/77	66°45'Nx108°45'W	18.0c	1							
3	13/8/77	66°29'Nx109°16'W	32.0a	5	1	1					
4	13/8/77	66°23'Nx109°28'W	30.0b	2							
5	13/8/77	66°24'Nx110°05'W	29.0a	4			1				
6	13/8/77	66°15'Nx111°15'W	28.0a	2							
7	13/8/77	66°12'Nx110°48'W	26.0a	4	1	5	*A				
8	13/8/77	66°10'Nx111°06'W	25.0c	4		1					
9	13/8/77	66°12'Nx111°20'W	24.0a	7		11					
10	13/8/77	66°07'Nx111°33'W	23.0a	3				1	1		
11	15/8/77	65°57'Nx111°23'W	21.0c	4							
12	15/8/77	65°44'Nx110°39'W	22.0b	2		1					
13	15/8/77	65°43'Nx109°56'W	24.0a	1							
14	22/7/77	65°25'Nx110°34'W	23.0f	6		5					1
15	22/7/77	65°25'Nx110°55'W	22.0a	2	1						
16	21/7/77	65°09'Nx110°16'W	20.0b	3	1	1					
17	21/7/77	65°13'Nx109°47'W	22.0b								
18	8/7/77	65°01'Nx109°41'W	23.0d	6							
19	8/7/77	64°57'Nx109°45'W	23.5b	1							
20	19/7/77	64°41'Nx108°10'W	24.5c	14							
21	19/7/77	64°37'Nx108°17'W	25.0c	12	8		1				

Table 11. (Con't.)

Set	Date	Location	Set Hrs. and Net Length (m)	Species and Numbers Caught						
				Lake Trout	Arctic Grayling	Round Whitefish	Longnose Sucker	Stimy Sculpin	Ninespine Stickleback	Lake Cisco
22	19/7/77	64° 33' N x 108° 35' W	25.0b	8	3					
23	8/7/77	64° 37' N x 109° 15' W	22.5d							
24	8/7/77	64° 46' N x 109° 20' W	22.5b	2						
25	15/8/77	66° 13' N x 108° 37' W	27.5a	3						
26	15/8/77	66° 06' N x 108° 29' W	26.5a							
27	15/8/77	65° 57' N x 108° 40' W	26.0b	2	2	1				
28	15/8/77	65° 45' N x 109° 30' W	25.0a	3						
29	20/7/77	65° 28' N x 108° 52' W	17.5g	2					1	
30	21/7/77	65° 24' N x 109° 15' W	18.0c	4		1				

a = 22.8 m

b = 18.3 m

c = 45.6 m

d = 91.4 m

f = 36.6 m mixed

g = 41.2 m varied mesh

h = seine

*A Johnson 1976 also reported the occurrence of Arctic char, humpbacked whitefish, and Arctic ciscos in Kathawachaga Lake.

Table 12. Fisheries resource sampling survey, raw data, Burnside River System, NWT.

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Lake Trout (<i>Salvelinus namaycush</i>)</u>								
1	Burnside River below Burnside Falls 66°53'Nx108°10'W 8/8/77	3.81 3.81 3.81	51.0 43.0 85.0	1320 750 5400	13 8	F		
2	Burnside River 66°45'Nx108°45'W 8/8/77	3.81	75.5	5000				
3	Unnamed Lake 66°29'Nx109°16'W 13/8/77	7.62 7.62 7.62 7.62 7.62	65.0 70.0 69.0 90.0 54.5	3300 3900 3850 9000 1560		M F M F	spent ripe near ripe	
4	Burnside River 66°23'Nx109°28'W 13/8/77	mixed mesh	66.0 50.0	3100 1300	28	F		
5	Burnside River 66°24'Nx110°05'W 13/8/77	3.81 3.81 3.81 3.81	75.0 76.0 50.0 68.0	3600 3600 1300 3800	12 30	M F	spent near ripe	

Table 12. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
6	Burnside River 66°15'Nx111°15'W 13/8/77	3.81	76.0	3600				
		3.81	20.0	50				
7	Kathawachaga Lake 66°12'Nx110°48'W 13/8/77	7.62	67.0	2600				
		7.62	73.0	3600				
		7.62	71.0	2720				
		7.62	37.5	480	14	F		
8	Kathawachaga Lake 66°10'Nx111°06'W 13/8/77	3.81	67.5	2500				
		3.81	78.0	5300				
		7.62	57.0	1780	16	M	spent ripe	Trichoptera
		7.62	62.0	2120	19	M		
9	Kathawachaga Lake 66°12'Nx111°20'W 13/8/77	7.62	74.0	4000				
		7.62	62.0	2250				
		7.62	81.0	5800	41	M	spent ripe	Small mammal and rock
		7.62	84.0	5500	41	F		
		7.62	72.0	4900				
		7.62	43.0	1000				
		7.62	82.0	5300				
10	Burnside River 66°07'Nx111°33'W 13/8/77	3.81	74.5	3600	42	M	ripe	
		3.81	63.0	2320				
		3.81	44.0	960	13	F		Slimy sculpin and Ninespine stickleback

Table 12. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
11	Contwoyto Lake 65°57'N x 111°23'W 15/8/77	3.81 3.81 3.81 3.81	66.0 69.0 20.0 19.0	3600 40 40 40	5	imm.		
12	Contwoyto Lake 65°44'N x 110°39'W 15/8/77	mixed mesh	56.0 42.5	1520 700	22 10	M F	spent spent	Trichoptera, Diptera
13	Unnamed Lake 65°43'N x 109°56'W 15/8/77	7.62	47.5	1000	25	M	spent	
14	Contwoyto Lake 65°25'N x 110°34'W 22/8/77	3.81 3.81 3.81 3.81 7.62 7.62	41.0 37.0 42.0 42.0 73.0 45.0	825 650 800 800 3400 875	12 7	F F		
15	Contwoyto Lake 65°25'N x 110°55'W 22/8/77	10.16 10.16	49.5 45.0	1500 1000	16	imm.		Ephemeroptera, Trichoptera, Mosquito larvae
16	Contwoyto Lake 65°09'N x 110°16'W 21/7/77	10.16 12.70 13.97	78.0 76.0 77.0	5300 4500 4500				

Table 12. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
18	Pellatt Lake 65°01'Nx109°41'W 8/7/77	3.81	58.5	2500	15	F	near ripe	Chironomids
		3.81	32.0	300		imm.		Chironomids, Black fly,
		3.81	26.5	180				Mosquito larvae
		11.43	65.0	3000				
		11.43	68.0	3200	34	F		Chironomids, Coleoptera, Gastropods
19	Pellatt Lake 64°57'Nx109°45'W 8/7/77	11.43	52.0	1800	19	M	near ripe	Chironomids
		13.97	47.0	1120				
20	Muskox Lake 64°41'Nx108°10'W 19/7/77	7.62	62.0	2900				
		7.62	42.5	780				
		7.62	46.5	1260	14	F	ripe	
		7.62	48.0	1000		F	near ripe	
		7.62	40.0	780		imm.		
		7.62	48.0	1100		F	ripe	
		7.62	48.5	1000		F	near ripe	
		7.62	52.0	1400		imm.		
		7.62	48.0	1060	18			Trichoptera
		7.62	49.0	1200	17	F	near ripe	
		7.62	48.5	700	16	imm.		Unidentified fish
		7.62	50.0	1100		F		
		7.62	68.5	3500	28	M	ripe	
		7.62	42.0	800		F		

Table 12. (Con't.)

Site	Sampling Location and Date	Mean (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
21	Muskox Lake 64°37'N x 108°17'W 19/7/77	7.62	51.5	1300				
		7.62	36.0	600		F	near ripe	
		7.62	75.0	3200		M	spent imm.	
		7.62	31.5	400				
		7.62	46.0	1000	17	F	near ripe	
		7.62	34.0	400				
		7.62	62.0	2300		F	near ripe	
		7.62	51.0	1300		F	near ripe	
		7.62	62.0	2600		M	near ripe	
		10.16	52.0	1500				
		10.16	70.0	3200				
		10.16	60.5	1700			unripe	
22	Icy River 64°33'N x 108°35'W 19/7/77	3.81	55.0	2960				
		5.08	57.0	2560	32	F	ripe	
		5.08	47.0	1280	13	M	near ripe	
		7.62	77.0	6200	28	F	near ripe	One 14" Arctic grayling
		10.16	92.0	8900				
		10.16	75.0	6200	34	M	ripe	
		13.97	74.0	6200	43	M	ripe	
		13.97	65.5	3500	28	F	ripe	One fish
		11.43	77.0	4500	41	F	near ripe	
		gut	small	lake trout	in gut of above			
24	Glowworm Lake 64°46'N x 109°20'W 8/7/77							

Table 12. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
25	Mara River 66°13'Nx108°37'W 15/8/77	7.62 7.62 7.62	90.0 62.0 42.0	6200 2500 1400	29	M	spent	
27	Mara River 65°57'Nx108°40'W 15/8/77	mixed mesh	43.5 34.5	800 320	10	F	spent	Minnows
28	Unnamed Lake 65°45'Nx109°30'W 15/8/77	10.16 10.16 10.16	61.0 82.0 44.0	2700 6300 820				
29	Mara River 65°28'Nx108°52'W 20/7/77	mixed mesh	55.0 74.0	1930 4900	18	F	ripe	Ninespine stickleback
30	Unnamed River 65°24'Nx109°15'W 21/7/77	3.81 3.81 3.81 11.43	53.0 51.0 31.0 72.0	1610 1300 360 4400	33 9	F	near ripe imm.	Bivalves Trichoptera
<u>Arctic grayling (<i>Thymallus arcticus</i>)</u>								
3	Unnamed Lake 66°29'Nx109°16'W 13/8/77	7.62	36.0	580	7	M		Gastropoda

Table 12. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
7	Kathawachaga Lake 66°12'Nx110°48'W 13/8/77	7.62	40.0	800	9	F		Coleoptera
15	Contwoyto Lake 65°25'Nx110°53'W 22/7/77	7.62	34.5	500				
16	Contwoyto Lake 65°09'Nx110°16'W 21/7/77	10.16	40.0	750				
21	Icy River 64°37'Nx108°17'W 19/7/77	7.62 7.62 7.62 7.62 7.62 7.62 7.62 7.62	39.0 39.0 38.0 36.0 41.0 38.0 38.0 38.0	600 600 650 600 700 650 600 600	9 10	M M	near ripe	Bugs
22	Icy River 64°33'Nx108°35'W 19/7/77	7.62 7.62 gut	29.5 40.0 ≈35.0 from lake trout	320 760	6 12	F M	near ripe mature	Blackfly larvae Blackfly larvae
27	Mara River 65°57'Nx108°40'W 15/8/77	mixed mesh	20.0 26.0	100 180	4	F		

Table 12. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<i>Round whitefish (Prosopium cylindraceum)</i>								
1	Burnside River below Burnside Falls 66°53'Nx108°10'W 8/8/77	3.81	25.5	150				
3	Unnamed Lake 66°29'Nx109°16'W 13/8/77	7.62	39.0	600	11	M		
7	Kathawachaga Lake 66°12'Nx110°48'W 13/8/77	7.62	38.0	6800	17	F	near ripe	Gastropoda
		7.62	48.0	1300	15	F	near ripe	Trichoptera,
		7.62	48.0	1280	4		imm.	Chironomid
		7.62	27.5	180				
		7.62	44.5	780		F	ripe	
8	Kathawachaga Lake 66°10'Nx111°06'W 13/8/77	7.62	47.0	1280	15	M	ripe	Trichoptera
9	Kathawachaga Lake 66°12'Nx111°20'W 13/8/77	7.62	44.0	980	13	M	ripe	
		7.62	46.0	1050	13	F	ripe	
		7.62	49.0	1120		M	ripe	
		7.62	43.0	850		M	ripe	
		7.62	46.0	1180				
		7.62	46.0	1220		M	ripe	Gastropoda
		7.62	46.0	980	12	M	ripe	

Table 12. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
9	Kathawachaga Lake (con't)	7.62	42.0	900		F		
		7.62	46.0	980		M	ripe	
		7.62	49.0	1480	16	M	ripe	
		7.62	44.0	950	15	F	ripe	Gastropoda
12	Contwoyto Lake 65°09'Nx110°16'W 15/8/77	12.70	38.5	600	11			
14	Contwoyto Lake 65°25'Nx110°34'W 22/7/77	3.81	31.5	350				
		3.81	38.5	700				
		3.81	39.0	680	14	M	ripe	
		3.81	38.5	600		F		Chironomids
		3.81	43.5	900	13	M	ripe	
16	Contwoyto Lake 65°09'Nx110°16'W 21/7/77	12.70	38.5	600	11			
27	Mara River 65°57'Nx108°40'W 15/8/77	mixed mesh	42.5	720	14	F	near ripe	
30	Unnamed River 65°24'Nx109°15'W 21/7/77	3.81	31.5	320	6	F	near ripe	Gastropoda

Table 12. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Longnose sucker (<i>Catostomus commersoni</i>)</u>								
5	Burnside River 66°24'Nx110°05'W 13/8/77	3.81	46.0	1100				
21	Muskox Lake 64°37'Nx108°17'W 19/7/77		39.0	840				
<u>Slimy sculpin (<i>Cottus cognatus</i>)</u>								
10	Burnside River 66°07'Nx111°33'W 13/8/77	gut	1	specimen in lake trout gut				
<u>Ninespine stickleback (<i>Pungitius pungitius</i>)</u>								
10	Burnside River 66°07'Nx111°33'W 13/8/77	gut	1	specimen in lake trout gut				
29	Mara River 65°28'Nx108°52'W 20/7/77	gut	1	specimen in lake trout gut				

Table 12. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Lake cisco</u> (<i>Coregonus artedii</i>)								
14	Contwoyto Lake 65°25'Nx110°34'W 22/7/77	3.81	37.5	600				

ELLICE, WESTERN, AND HIUKITAK RIVERS

General

These are the three major rivers east of Bathurst Inlet; each flows into the Arctic Ocean (Fig. 8). The 145 km (90mi) Western River drains 3,833 sq km (1,480 sq mi) of barrens (Water Survey of Canada 1976). The river has a high silt content and meanders between high rock cliffs. The river bed consists of sand and rock and the banks are either bare rock, grassy or occasionally covered with willows. The Hiukitak and Ellice are clear rivers flowing swiftly over rock or sand. Their banks are either bare rock or are covered with grass and low shrubs. Within the area surveyed, the Ellice River drains about 16,965 sq km (6,550 sq mi) and the mean daily cubic meters/second discharge varies from a high in July of 305 to 0 (7240-0 cfs) during December through April when the river is ice-bound. The Hiukitak River is about 145 km (90 mi) long and it drains the land between the Ellice River and the southeast side of Bathurst Inlet.

Aquatic Resources

The Ellice and Hiukitak rivers contain spawning grounds for Arctic char. Arctic char probably migrate upstream to spawn during August and September in most of the rivers entering the east side of Bathurst Inlet, and into the Arctic Ocean near Kent Peninsula. They return to the sea during May and June. The limit of upstream migration is unknown. Many of the small lakes surrounding the inlet do support populations of landlocked char. Trout in this area were very slow growing (eg 4000 gm (140 oz) in 45 yrs.).

The Western River may serve only as a short migration route for char spawning in Bathurst Lake. It is known to the Inuit as 'Poor Fish' River. Fish tagged at Nauyuk Lake, on the Kent Peninsula, are known to enter Bathurst Lake

(Johnson 1977 pers comm.).

Two previous survey expeditions have touched on this area, the Canadian Arctic Expedition in 1913 (Walters 1953), and the 1959 Fisheries Survey (Johnson 1976). Data from the present survey are presented in Tables 13 and 14.

Domestic and Commercial Fishing

The Ellice River has an annual quota of 13620 kg rnd. (30,000 lb) of searun char. The rivers' mouth is fished by the Cambridge Bay fishing co-operative and the quota is usually attained. The unnamed river east of Brichta Lake has an annual searun Arctic char quota of 9080 kg rnd. (20,000 lb) at the river mouth. Inuit from Bay Chimo and Bathurst Inlet net Arctic char in the fall as the char migrate upstream to spawn at the mouth of Hiukitak River. Inuit living at Bathurst Inlet fish for Arctic char and lake trout after the spring ice break-up and before freeze-up in the fall near the community. Most of the fish are dried for canine and/or human consumption in winter (see also Sutherland and Golke 1978).

FIGURE 8: ELLICE, WESTERN and HIUKITAK RIVERS

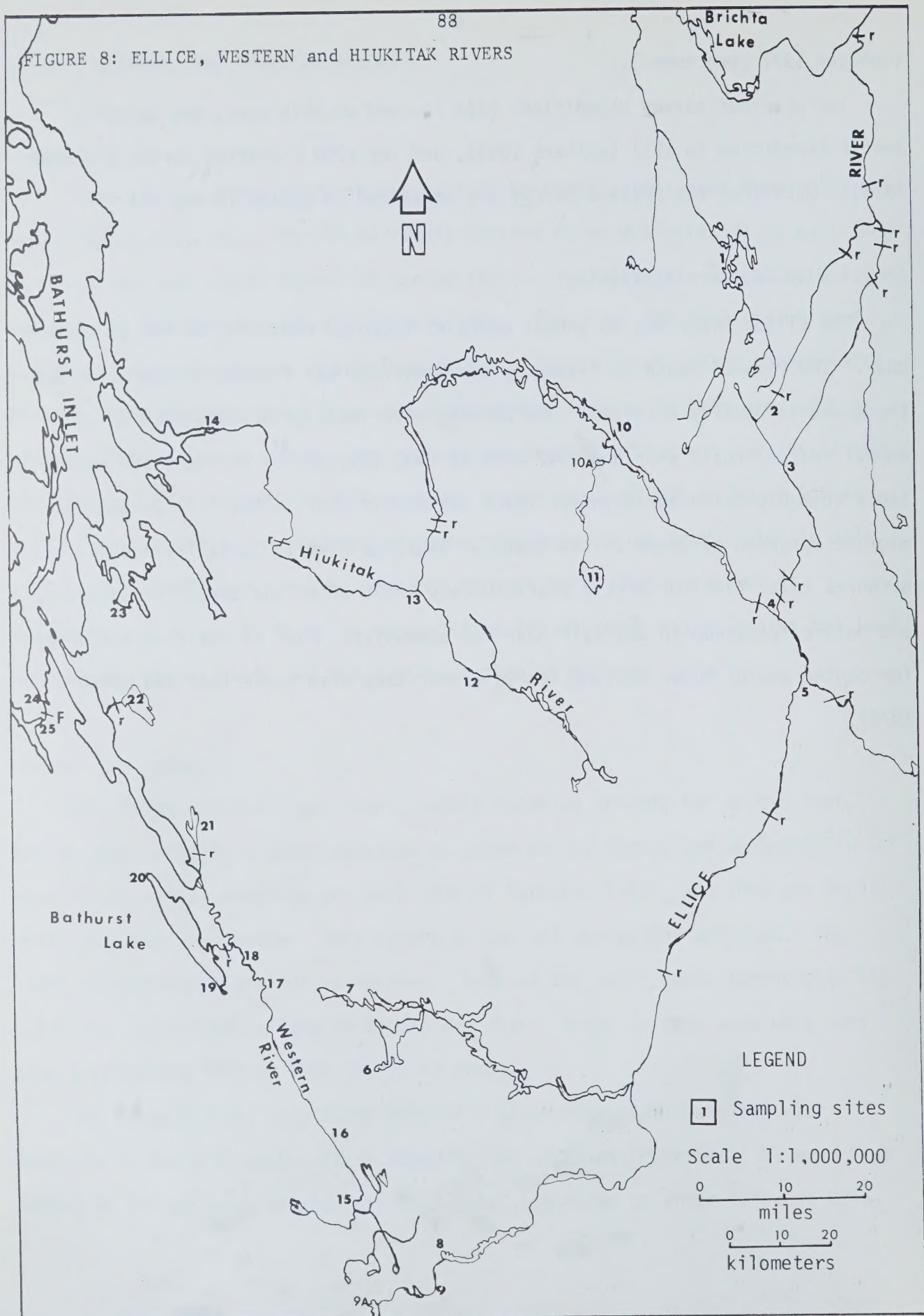


Table 13. Fisheries resource sampling summary, Ellice, Western, and Hiukitak Rivers, NWT.

Species and Numbers Caught				Lake trout	Arctic char	Arctic grayling	Round whitefish	Broad whitefish	Whitefish (sp.)	Arctic cisco	Cisco (sp.)	Longnose sucker	Ninespine stickleback	Stimy sculpin	Four horned sculpin *C	Flounder *C
Site	Date	Location	Set Hrs. and Net Length (m)													
1	6/8/77	67°24'Nx104°50'W	24.0a	10							3	3	4			
2	6/8/77	67°10'Nx104°38'W	25.0a	2												
3	6/8/77	67°04'Nx104°36'W	26.0a	1		1										
4	5/8/77	66°48'Nx104°39'W	22.0a	7												
5	5/8/77	66°42.5'Nx104°30'W	22.0a	5		1			1							
6	3/8/77	66°02.5'Nx106°25'W	31.0a	1		2										
7	3/8/77	66°09'Nx106°32.5'W	32.0b	4												
8	3/8/77	65°42'Nx106°07'W	30.0a	7												
9	3/8/77	65°37'Nx106°14'W	29.0a	6												
9a	3/8/77	65°37'Nx106°25'W	28.0a													
10	6/8/77	67°08'Nx105°22'W	22.5a	4	2	1										
10a	6/8/77	67°04.5'Nx105°26'W	21.0a													
11	5/8/77	66°52'Nx105°27'W	26.0a	7												
12	5/8/77	66°43'Nx105°58'W	18.0a	2												
13	5/8/77	66°51'Nx106°07'W	24.0b	5	*AB	2 ^B *	1 ^B *		*B			*B				
14	6/8/77	67°08'Nx107°13'W	19.0c		4											
15	3/8/77	65°47'Nx106°30'W	29.0a	3												
16	3/8/77	65°53'Nx106°35'W	26.5c				1									
17	2/8/77	66°10'Nx106°55'W	23.0b													
18	2/8/77	66°14'Nx107°00'W	22.5a	1			4									1

Table 13. (Con't.)

Site	Date	Location	Set Hrs. and Net Length (m)	Species and Numbers Caught													
				Lake trout	Arctic char	Arctic grayling	Round whitefish	Broad whitefish	Whitefish (sp.)	Arctic cisco	Cisco (sp.)	Longnose sucker	Ninespine stickleback	Stimy sculpin	Four horned sculpin *C	Flounder *C	
19	3/8/77	66°10'Nx107°03'W	46.0b	2	1												
20	3/8/77	66°22'Nx107°20'W	48.0a	2													
21	2/8/77	66°20'Nx107°13'W	22.5a	16			3										
22	2/8/77	66°40'Nx107°28'W	22.0a	6	2												
23	5/8/77	66°51'Nx107°26'W	16.5a		*												
24	3/8/77	66°40'Nx107°50'W	43.5a	4	*												
25	3/8/77	66°37.5'Nx107°55'W	46.0a	10	*		1										

a = 22.8 m
b = 18.3 m
c = 45.6 m
d = 91.4 m

*A = locals

*B = 1976 ALUR survey, Sutherland and Golke 1978.

*C = For further information on marine fish species and their ecology see McAllister 1966, 1977; Walters 1953, 1955.

Table 14. Fisheries resource sampling survey, raw data, Ellice, Western and Hiukitak Rivers.

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Lake trout (<i>Salvelinus namaycush</i>)</u>								
1	Unnamed Lake 67°24'Nx104°50'W 6/8/77	10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16	71.0 57.0 54.0 60.0 56.0 52.0 51.0 48.0 41.0 65.5	3400 1600 1500 2100 1750 1150 1250 1150 720 2400	22 15 27 13 11 10+ 35	F F M M F F F	almost ripe	Plecoptera Unidentified fish Lake trout 3 ciscos 4 ninespine stickleback
2	Ellice River 67°10'Nx104°38'W 6/8/77	10.16 10.16	60.0 48.0	2150 1200	11	M		
3	Ellice River 67°04'Nx104°36'W 6/8/77	7.62	45.0	970	11	F	spent	Grayling
4	Ellice River 66°48'Nx104°39'W 5/8/77	3.81 3.81 3.81 3.81 3.81 3.81 3.81	54.0 43.0 49.0 78.0 82.0 39.0 80.0	1600 900 1100 5400 5800 700 5400				

Table 14. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
5	Ellice River 66°42.5'Nx104°30'W 5/8/77	11.43	60.0	2500				
		11.43	58.0	3400				
		11.43	59.0	2040	21	F		Whitefish
		11.43	60.0	2450	23	F		Grayling
		11.43	42.0	950				
6	66°02.5'Nx106°25'W 3/8/77	7.62	47.0	1380				
7	66°09'Nx106°32.5'W 3/8/77	7.62	56.0	1300				
		7.62	78.0	4500	41	F	ripe	
		10.16	67.0	3000	26	M	spent	Unidentified fish
		5.08	50.0	1400	17	F		Trichoptera
8	Lake on Ellice River 64°42'Nx106°07'W 3/8/77	7.62	60.0	1850				
		7.62	72.0	3400				
		7.62	81.0	5400				
		7.62	81.0	5200				
		7.62	32.0	400	8		imm.	
		7.62	66.5	2950	29	M	spent	
		7.62	tail only					
9	Ellice River 65°37'Nx106°14'W 3/8/77	10.16	69.0	3000				
		10.16	72.0	2500				
		10.16	66.0	3200				
		10.16	64.0	2600	34	M	ripe	
		10.16	59.0	2100	22	M		
		10.16	45.0	1000	29	F	ripe	

Table 14. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
10	Lake on Ellice River 67°08'Nx105°22'W 6/8/77	8.89	60.0	2350				
		8.89	85.0	4500				
		8.89	87.0	8100	30	F		Unidentified fish
		8.89	97.0	9800	33	F		Char
11	Lake on Ellice River 66°52'Nx105°27'W 5/8/77	7.62	99.0	12800				
		7.62	65.0	2500				
		7.62	67.0	3200				
		7.62	57.0	1600	27			
		7.62	53.0	1400	20	M	spent	2 Unidentified fish
12	Hiukitak River 66°43'Nx105°58'W 5/8/77	7.62	49.0	1100	19	F		
		7.62	45.0	900	18	F		
		7.62	45.0	900	16	F		
12		10.16	61.0	2400	32	M	ripe	
		10.16	61.0	2300	22	F		
13	Hiukitak River 66°51'Nx106°07'W 5/8/77	mixed mesh	65.0	2500				
			60.0	2000				
			72.0	3600				
			78.0	5400	23	M	spent	
			51.5	1800	33	M	spent	
15	Western River 65°47'Nx106°30'W 3/8/77	10.16	66.0	3600				
		10.16	52.0	1600	17	F		
		10.16	51.0	1320	19	M	spent	

Table 14. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
18	Western River 66°14'Nx107°00'W 2/8/77	3.81	46.0	1150				
19	Bathurst Lake 66°10'Nx107°03'W 3/8/77	7.62 7.62	85.0 75.0	6000 3600	40			
20	Bathurst Lake 66°22'Nx107°20'W 3/8/77	7.62 7.62	55.0 68.0	2100 3600	35	M	ripe and running	
21	Unnamed Lake 66°20'Nx107°13'W 2/8/77	10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16 10.16	38.0 42.0 34.0 45.0 46.0 43.0 40.0 45.0 42.0 41.0 45.0 43.0 32.5 44.0 52.0 69.0	520 880 550 980 1020 1000 750 1000 1000 820 980 860 420 880 1500 3600	11 20 27 31	M F M	ripe	

Table 14. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
22	Unnamed Lake 66°40'N x 107°28'W 2/8/77	3.81	55.5	1750				
		3.81	79.0	3200				
		3.81	52.0	1500				
		3.81	60.0	2000	25	F		Trichoptera
		3.81	52.0	1400	33	M		Ninespine
		3.81	44.0	1100	16	F		stickleback
24	Bay below Window Falls 66°40'N x 107°50'W 3/8/77	11.43	50.0	1400				
		11.43	76.0	4700				
		11.43	59.0	2400				
		11.43	53.0	1700	23	M	ripe	3 Unidentified fish
25	"Fishing Lake" 66°37.5'N x 107°55'W 3/8/77	8.89	68.0	3900				
		8.89	66.0	2800	36	M	spent	Unidentified fish
		8.89	71.5	3400	25	M	spent	
		8.89	83.0	5600	43	M	ripe	
		8.89	76.5	4400	35	F	ripe	
		8.89	75.0	4300	38	M	ripe	
		8.89	80.5	4000	45	M	spent	
		8.89	49.5	1220	26	F		Slimy sculpin
		8.89	45.0	1050	23	M		Trichoptera
		8.89	81.0	5000	36	M	running	

Table 14. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
6	Lake on Ellice River 66°02.5'Nx106°25'W 3/8/77	7.62 7.62	36.0 32.0	630 520	7	M		Trichoptera larvae
10	Lake on Ellice River 67°08'Nx105°22'W 6/8/77	8.89	36.0	600	11	M		Coleoptera
13	Hiukitak River 66°51'Nx106°07'W 5/8/77	mixed mesh	28.5 29.0	600 650	10 8	F M		Chironomidae Plecoptera
<u>Round whitefish (<i>Prosopium cylindraceum</i>)</u>								
13	Hiukitak River 66°51'Nx106°07'W 5/8/77	mixed mesh	31.0	700	8	F		
16	Western River 65°53'Nx106°35'W 3/8/77	3.81	40.0	800				
18	Western River 66°14'Nx107°00'W 2/8/77	3.81 3.81 3.81 3.81	18.0 21.5 24.5 22.0	100 140 180 180	5 4		imm. imm.	

Table 14. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
21	Unnamed Lake 66°20'Nx107°13'W 2/8/77	10.16 10.16 10.16	41.0 42.0 42.0	850 1050 1000	12	F M		Trichoptera Trichoptera
25	"Fishing Lake" 66°37.5'Nx107°55'W 3/8/77	8.89	39.0	680				
<u>Broad whitefish (<i>Coregonus nasus</i>)</u>								
24	Lake below Window Falls 66°40'Nx107°50'W 3/8/77	11.43	45.0	1120				
<u>Whitefish, species unknown (<i>SF. Coregoninae</i>)</u>								
5	Ellice River 66°42.5'Nx104°30'W 5/8/77						Found in lake trout stomach	
<u>Arctic cisco (<i>Coregonus autumnalis</i>)</u>								
17	Western River 66°10'Nx106°55'W 2/8/77	7.62	39.0	700	10	M		

Table 14. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Cisco (<i>Coregonus</i> sp.)</u>								
1	67°24'Nx104°50'W 6/8/77		3 ciscos found in lake trout stomach					
<u>Longnose sucker (<i>Catostomus commersoni</i>)</u>								
2	Ellice River 67°10'Nx104°38'W 6/8/77	10.16 10.16 10.16	40.0 42.0 38.0	1000 1000 600				
<u>Ninespine stickleback (<i>Pungitius pungitius</i>)</u>								
1	Unnamed Lake 67°24'Nx104°50'W 6/8/77		4 found in trout stomach					
22	Unnamed Lake 66°40'Nx107°28'W 2/8/77		Found in fish stomach					
<u>Slimy sculpin (<i>Cottus cognatus</i>)</u>								
25	"Fishing Lake" 67°37.5'Nx107°55'W 3/8/77		Found in lake trout stomach					

Table 14. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<i>Four horned sculpin (Myoxocephalus quadricornis quadricornis)</i>								
24	Brackish Lake below Window Falls 66°40'Nx107°50'W 3/8/77		25.5 27.0	200 150				
<i>Flounders (F. Pleuronectidae)</i>								
14	Hiukitak River mouth 67°08'Nx107°13'W 6/8/77	7.62	15.0	40				
23	Unnamed Brackish Lake 66°51'Nx107°26'W 5/8/77	10.16 10.16 10.16	29.0 29.0 21.0	350 480 200				
24	Brackish Lake below Window Falls 66°40'Nx107°50'W 3/8/77	11.43	18.5	150				

BACK RIVER DRAINAGE SYSTEM

General

This area includes the Back River (from the Icy River to 104° West), Duggan and Beechey lakes, and the Baillie River (Fig. 9). The Baillie, at its junction with the Back, drains approximately 15,540 sq km (6,000 sq mi). The survey encompassed the first 322 km (200 mi) of the main channel of the Back River and all of the Baillie River (Water Survey of Canada 1976).

The Back and Baillie rivers generally have a moderate current and are frequently interrupted by rapids. Both rivers flow over rock or sand and vegetation on their banks is limited to low scrub and small plants.

The first whiteman to visit the Back River was Captain George Back who was travelling to the Arctic Ocean to find Sir John Franklin's second expedition (Back 1970). They did not locate Franklin but Back lists in his diary several fish species caught on the Back River, including trout, suckers, grayling and whitefish.

Aquatic Resources

Pike were caught in the Baillie and Back rivers. The only other pike caught during the survey were from Coppermine and Snare rivers. The Back is also noted for its large lake trout. Longnose suckers, Arctic grayling and lake ciscos are reported to make spawning migrations to the area of Muskox Rapids, at the outlet of Muskox Lake. Sampling Data are presented in Tables 15 and 16.

FIGURE 9: BACK RIVER DRAINAGE SYSTEM

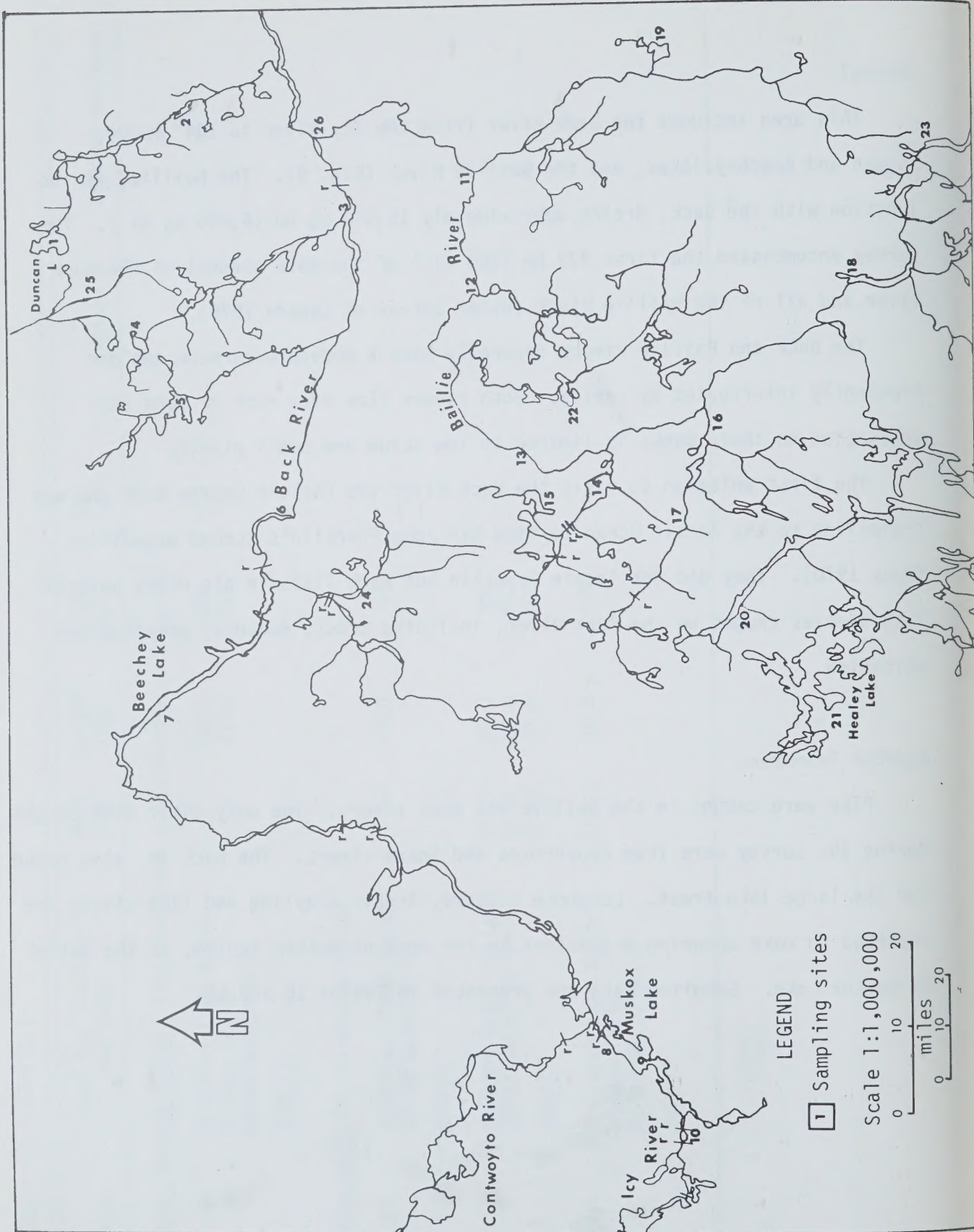


Table 15. Fisheries resource sampling summary, Back River Drainage System, NWT.

Set	Date	Location	Set Hrs. and Net Length (m)	Species and Numbers Caught											
				Lake trout	Arctic grayling	Round whitefish	Humpback whitefish	Lake cisco	Least cisco	Ciscos (Subgenus Leucichthys)	Northern pike	Longnose sucker	Burbot	Stimy sculpin	
1	30/7/77	65°34'Nx104°53'W	34.5b	11											1
2	30/7/77	65°21'Nx104°26'W	37.0a	5	1	3							1		
3	30/7/77	65°04'Nx104°53'W	39.5a	4											
4	30/7/77	65°26'Nx105°22'W	32.0a	7	1										
5	30/7/77	65°22'Nx105°37'W	31.0c	9						1	7				
6	30/7/77	65°10'Nx106°07'W	29.0a	13A	1	1									
7	1959	66°30'Nx107°00'W	-	*	*	*	*				*B		*	*	*
8	19/7/77	64°41'Nx108°10'W	24.5c	14											
9	19/7/77	64°37'Nx108°17'W	25.0c	12	8	1							*	*	*
10	19/7/77	64°33'Nx108°35'W	25.0b	8	2										
11	28/7/77	64°52'Nx104°48'W	25.0a	3								1			
12	30/7/77	64°50'Nx105°13'W	72.0a										6		
13	31/7/77	64°42'Nx105°54'W	72.0a	8	1			1					1		
14	28/7/77	64°44'Nx106°10'W	24.0b			2							1		
15	29/7/77	64°47'Nx106°07'W	24.0c	9							3				
16	28/7/77	64°30'Nx105°47'W	24.0a	5											1
17	28/7/77	64°32'Nx106°15'W	24.0b	1											
18	28/7/77	64°15'Nx105°17'W	24.0c	8		2							5		
19	28/7/77	64°33'Nx104°23'W	24.5a	6										2	
20	28/7/77	64°26'Nx106°28'W	24.0b	4											
21	28/7/77	64°22'Nx106°50'W	24.0a	6											

Table 15. (Con't.)

Set	Date	Location	Set Hrs. and Net Length (m)	Species and Numbers Caught											
				Lake trout	Arctic grayling	Round whitefish	Humpback whitefish	Lake cisco	Least cisco	Ciscos (Subgenus Leucichthys)	Northern pike	Longnose sucker	Burbot	Stimysculpin	
22	28/7/77	64 43'Nx105 42'W	24.0a	3	1										
23	28/7/77	64 07'Nx104 47'W	24.0a												
24	30/7/77	65 05'Nx106 24'W	28.0a												
25	30/7/77	65 32.5'Nx105 10'W	33.0a												
26	30/7/77	65 07'Nx104 37'W	38.5a												

a = 22.8 m
 b = 18.3 m
 c = 45.6 m
 d = 91.4 m

*A - Johnson 1976

*B - Pers. Comm. N. Murphy, Trapper

Table 16. Fisheries resource sampling survey, raw data, Back River Drainage System, NWT.

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Lake trout (<i>Salvelinus namaycush</i>)</u>								
1	Duncan Lake 65°34'Nx104°53'W 30/7/77	12.70	76.0	4400		F		
		12.70	61.0	2080				
		3.72	61.0	2200				
		3.72	59.0	2400				
		10.16	65.0	2200				
		10.16	60.0	2420		M	spent	
		5.08	62.0	2430				
		5.08	55.0	1900	33	M	ripe	Bivalves
		3.81	58.0	2000	3200	F		Slimy sculpin
		3.81	56.0	2000				
2	Tributary of Back R. 65°21'Nx104°26'W 30/7/77	10.16	46.0	1120	12	F		
		10.16	49.0	1340	18	F		Bivalves
		10.16	51.0	1620	17	M	ripe	
		10.16	52.0	1850	23	F		Bivalves
		10.16	51.0	1600				
3	Back River 65°04'Nx104°53'W 30/7/77	3.81	48.0	1180				
		3.81	50.0	1450				
		3.81	51.0	1400				
		3.81	48.0	1050				
4	Unnamed Lake flowing into the Back River 65°26'Nx105°22'W	8.89	76.0	4700		M	spent	
		8.89	60.0	2300		F	near ripe	
		3.89	59.0	2000				

Table 16. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
4	Unnamed Lake (Con't.) 30/7/77	8.89	63.0	2700		F	ripe	
		8.89	52.0	1640	20	M	ripe	
		8.89	64.0	2100	39	M	spent	
		8.89	76.0	5100	27	M	spent	Lake trout
5	Lake flowing into Back River 65°22'Nx105°37'W 30/7/77	3.81	65.0	2800				
		3.81	56.0	2200				
		3.81	57.0	1900				
		3.81	90.0	6200				
		3.81	64.0	2600		M		
		3.81	58.0	2400		F		Trichoptera, 1 cisco
		3.81	47.0	1180	15			
								6 cisco
6	Back River 65°10'Nx106°07'W 30/7/77	7.62	49.0	1430	12	F		
		7.62	60.0	4100		M		
		8.89	51.0	1500				
		8.89	52.0	1400				
		8.89	53.0	1700				
		8.89	58.0	1900				
		8.89	52.0	1400				
		8.89	55.0	1500		F	near ripe	
		8.89	51.0	1500		F	near ripe	
		8.89	49.0	1300		M	near ripe	
		8.89	45.0	900		F		
		8.89	51.5	1500	14	F		
		8.89	58.5	2250	21	M	ripe	
		8.89	62.0	2300	27	F	ripe	
		8.89	51.5	1480	15	F	ripe	

Table 16. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
7	Beechey Lake 66°30'Nx107°00'W 1959		Lake trout were reported (Johnson 1976) present during the 1959 Arctic fishes survey conducted by St. Anne de Bellvue research station.					
8	Muskox Lake 64°41'Nx108°10'W 19/7/77	7.62	62.0	2900				
		7.62	42.5	780				
		7.62	46.5	1260	14	F	ripe	
		7.62	48.0	1000		F	near ripe	
		7.62	40.0	780		F	imm.	
		7.62	48.0	1100		F	ripe	
		7.62	48.5	1000		F	near ripe	
		7.62	52.0	1400			unripe	
		7.62	48.0	1060	18		unripe	Trichoptera
		7.62	49.0	1200	17	F	near ripe	
9	Muskox Lake 64°37'Nx108°17'W 19/7/77	7.62	48.5	700	16		imm.	4 Unidentified fish
		7.62	50.0	1100		F		
		7.62	68.5	3500	28	M	ripe	
		7.62	42.0	800		F		
		7.62	51.5	1300				
		7.62	36.0	600		F	near ripe	
		7.62	75.0	3200		M	spent	
		7.62	31.5	400			imm.	
		7.62	46.0	1000	17	F	near ripe	
		7.62	34.0	400				
		7.62	62.0	2300		F	near ripe	

Table 16. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
9	Muskox Lake (Con't.)	7.62 7.62 10.16 10.16 10.16	51.0 62.0 52.0 70.0 60.5	1300 2600 1500 3200 1700		F M	near ripe near ripe imm.	
10	Icy River 64°33'Nx108°35'W 19/7/77	3.81 5.08 5.08 7.62 10.16 10.16 13.97 13.97	55.0 57.0 47.0 77.0 92.0 75.0 74.0 65.5	2960 2560 1280 6200 8900 6200 6200 3500	32 13 28 34 43	F M F M M F	ripe near ripe near ripe ripe ripe ripe	Grayling Blackfly larva Blackfly larva Unidentified fish
11	Baillie River 64°52'Nx104°48'W 28/7/77	10.16 10.16 10.16	43.0 49.5 57.0	920 1230 3000				
13	Baillie River 64°42'Nx105°54'W 31/7/77	7.62 7.62 7.62 7.62 7.62 7.62 7.62	71.0 50.5 44.0 46.0 51.5 42.0 48.5 49.0	8000 1980 1050 1020 1500 850 1320 1200		F M F M M M F	spent ripe ripe	

Table 16. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
15	Unnamed Lake on tributary of Baillie R. 64°47'Nx106°07'W 29/7/77	3.81	52.0	1500	24	F		Unidentified fish
		3.81	50.5	1580	17	M	ripe	
		3.81	51.0	1600				
		10.16	49.0	1450				
		10.16	62.0	2340	24	F		3 ciscos
		10.16	51.5	1400	26	M		
		10.16	84.5	7500	36	M	ripe	
		10.16	76.0	6700				
		10.16	50.0	1550				
16	Baillie River 64°30'Nx105°47'W 28/7/77	8.89	51.0	1650	28	M	ripe	Slimy sculpin
		8.89	46.5	1130	12	M	ripe	
		8.89	46.0	1040	26	M	ripe	
		8.89	44.0	980	13		imm.	Gastropods
		8.89	44.5	930	16	M		
17	Tributary of Baillie R. 64°32'Nx106°15'W 28/7/77	10.16	45.0	1000	10	F		Unidentified fish
18	Baillie River 64°15'Nx105°17'W 28/7/77	7.62	45.0	1000	8			Unidentified fish
		7.62	56.0	1800	19	M	imm.	Unidentified fish
		7.62	45.0	1030	18	M		
		3.81	46.0	1300				
		3.81	47.0	1300				
		3.81	63.0	2100				
		3.81	41.0	800	8	F		Unidentified fish
		3.81	40.0	700	10		imm.	Gastropods

Table 16. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
19	Unnamed Lake flowing into Baillie River 64°33'Nx104°23'W 28/7/77	7.62 7.62 7.62 7.62 7.62 7.62	60.0 71.0 59.0 61.0 55.0 66.0	2800 3600 3000 2500 2000 3500	25 10 20	M F F	ripe ripe ripe	Lake cisco 2 Lake cisco
20	Baillie R. tributary 64°26'Nx106°28'W 28/7/77	3.81 3.81	75.0 41.5	4600 700	8		imm.	3 Unidentified fish
21	Healey Lake 64°22'Nx106°50'W 28/7/77	7.62 7.62 7.62 7.62 7.62	54.0 56.5 66.0 38.0 62.0 53.0 63.0 46.0	1560 1700 2700 540 2550 1400 2350 1100	8 17	F		
23	64°07'Nx104°47'W 28/7/77	3.81 3.81 3.81	54.0 59.0 58.0	1800 2500 2000	28 11	F	imm.	Hemiptera
<u>Arctic grayling (<i>Thymallus arcticus</i>)</u>								
3	Back River 65°04'Nx104°53'W 30/7/77	3.81	37.0	600				

Table 16. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Round whitefish (<i>Prosopium cylindraceum</i>)</u>								
3	Back River 64°04'Nx104°53'W 30/7/77	3.81 3.81 3.81	20.5 20.0 23.0	90 90 180				
6	Back River 65°10'Nx106°07'W 30/7/77	8.89	43.0	800				
7	Beechey Lake 65°30'Nx107°00'W 1959							Johnson (1976) reported the occurrence of round whitefish in Beechey Lake
9	Muskox Lake 64°37'Nx108°17'W 19/7/77	7.62	39.0	840				
14	River near Tourgis Lake 64°44'Nx106°10'W 28/7/77	3.81 3.81	29.0 35.0	300 500	6 8	M F		Trichoptera, caterpillar Trichoptera, chironomids
18	Baillie River 64°15'Nx105°17'W 28/7/77	3.81 3.81	44.0 39.5	1000 650	15 15	M M	ripe	Gastropods Trichoptera

Table 16. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
23	64°07'Nx104°47'W 28/7/77	3.81	37.0	680	13	F		
<u>Humpback whitefish (<i>Coregonus clupeaformis</i>)</u>								
7	Beechey Lake 65°30'Nx107°00'W 1959							Johnson (1976) reported the occurrence of lake whitefish in Beechey Lake.
13	Baillie River 64°42'Nx105°54'W 31/7/77	7.62	46.0	1280		F		
18	Baillie River 64°15'Nx105°17'W 28/7/77	3.81 7.62	60.0 42.0	2800 1000	12 6+	F F		Gastropods
<u>Lake cisco (<i>Coregonus artedii</i>)</u>								
19	Unnamed Lake flowing into Baillie River 64°33'Nx104°23'W 28/7/77	7.62	16.0	50	3			2.0 ciscos in trout guts.

Table 16. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
<u>Least cisco</u> (<i>Coregonus sardinella</i>)								
5	Lake on tributary of Baillie River 65°22'Nx105°37'W 30/7/77	7.62	12.0-14.0	Damaged specimen.				
<u>Ciscos</u> (<i>Subgenus leucichthys</i>) Species unknown								
5	Lake on tributary of Baillie River 65°22'Nx105°37'W 30/7/77							7.0 ciscos in trout stomachs.
15	Unnamed Lake on tributary of Baillie R. 64°47'Nx106°07'W 29/7/77							3.0 ciscos in trout stomachs.
<u>Northern pike</u> (<i>Esox lucius</i>)								
11	Baillie River 64°52'Nx104°48'W 28/7/77	10.16	57.0	1500				

Table 16. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
16	Baillie River 64°30'Nx105°47'W 28/7/77	8.89	52.0	1060	4	M		
<u>Longnose sucker (<i>Catostomus catastomus</i>)</u>								
3	Back River 65°04'Nx104°53'W 30/7/77	3.81	37.0	800				
7	Beechey Lake 66°30'Nx107°00'W 1959							Johnson (1976) reported longnose suckers in Beechey Lake.
12	Baillie River 64°52'Nx105°13'W 30/7/77	10.16 10.16 10.16 10.16 10.16 10.16	42.5 50.0 41.0 43.5 45.0 41.0	1040 1610 850 1080 1260 1000		M F F F M M		
13	Baillie River 64°42'Nx105°54'W 31/7/77	7.62	38.0	1300				

Table 16. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
14	River north of Tourgis Lake 64°44'Nx106°10'W 28/7/77	10.16	37.0	780				
17	Tributary of the Baillie River 64°32'Nx106°15'W 28/7/77	10.16 10.16 10.16 10.16 10.16	44.0 45.0 44.0 33.0 43.0	1400 1250 1100 550 1100				
18	Baillie River 64°15'Nx105°17'W 28/7/77	3.81 3.81	46.0 40.0	1300 1000				
<u>Burbot (<i>Lota lota</i>)</u>								
7	Beechey Lake 66°30'Nx107°00'W 1959							Johnson (1976) reported the occurrence of burbot in Beechey Lake.
<u>Slimy sculpin (<i>Cottus cognatus</i>)</u>								
1	Duncan Lake 65°34'Nx104°53'W 30/7/77							Slimy sculpin found in trout stomach.

Table 16. (Con't.)

Site	Sampling Location and Date	Mesh (cm)	Length (cm)	Weight (g)	Age (yr)	Sex	Maturity	Stomach Contents
16	Baillie River 64°30'Nx105°47'W 28/7/77							Slimy sculpin found in trout stomach.

APPENDIX A

Species Biology

Habitat requirements vary according to fish species. Lake trout are abundant in most clear northern lakes, rivers and streams. They spawn over gravel or rocky shallows, especially near tributary stream mouths, in August or September. Arctic grayling inhabit clear lakes, rivers and streams, often concentrating at rapids. They are particularly vulnerable in May and June when they migrate into small tributaries to spawn in shallow moving water over a gravel or rocky bottom. While many variations occur, anadromous Arctic char generally perform a seaward migration from freshwater overwintering areas during spring ice break-up. They spend some part of the summer in the sea and migrate upstream in fall, usually August and September. Spawning takes place over gravel in lakes and below rapids in larger rivers, from August to October. The eggs incubate during winter and the young char spend their early years in fresh water. Longnose suckers, common to most northern lakes and rivers, spawn in lake shallows or migrate upstream into tributaries, to spawn in May or June. Northern pike are found in shallow lakes and quiet rivers and spawn in vegetated shallows in May or June, often performing upstream migrations at that time. The several species of whitefish and cisco spawn from early August to October and some populations perform distinct migrations. Spawning generally occurs over shallow rocky reefs or gravel beds in lakes or rivers. Slimy sculpin and nine-spine stickleback are common throughout the area and are a food source for larger, carnivorous fishes (McPhail and Lindsey 1970; Scott and Crossman 1973).

Domestic Fishing

Domestic fishing is an inexpensive form of food production that requires only minimal capital and equipment. Fishing occurs year-round, but often it is intensified in the fall and winter when fish are preserved for winter use by trappers, hunters and dog teams. Gill netting is the primary means of harvesting fish, which are usually dried or frozen for future use.

General Notes on Hazards to Fish

The greatest dangers to fish resulting from land-use operations are the delaying of migratory runs and the destruction of spawning area. Barriers to spawning migrations, such as road or hydroelectric construction, can deplete populations and may cause them to disappear from an area. Stream beds are a source of gravel for construction purposes, but extraction from certain localities can result in the lateration or elimination of a critical spawning ground. Sedimentation of streams as a result of seismic work, road building, or other construction, or due to bank erosion caused indirectly by these activities, may be detrimental to fish populations. In the north, deep pools that do not freeze to the bottom are often vital to the maintenance of fish populations. A reduction of stream level may cause these pools to freeze solid or to become anoxic. Pollution can have serious consequences for fish populations and habitats. Northern fish populations are easily susceptible to overfishing pressures because growth of individuals is slow and spawning of some species (e.g. lake trout, humpback whitefish, lake ciscos, and Arctic char) may occur only every 2 or 3 years.

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P.H. Beaubier and T. Pierce - *Recreation Tourism Evaluation*, Lands Directorate, August 1974, 35p.

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